

## A World Revision of the Ant Tribe Basicerotini (Hym. Formicidae)

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(With 63 text-figures)

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Incertae sedis

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### Introduction

The Basicerotini first emerged in the literature as a separate tribe of subfamily Myrmicinae only ten years ago (Brown, 1949). Before that, *Basiceros* and *Rhopalothrix* had been considered for a long time to belong to tribe Dacetini (Emery, 1922) along with such extraneous elements as *Blepharidatta* Wheeler (now placed in tribe Ochetomyrmicini) and *Peronomyrmex* Viehmeyer (at present thought to be near *Lordomyrma* Emery). It is now even clearer than in 1949 that the basicerotine genera are not especially closely related to the dacetines, and that the characters held in common by some members of the two tribes are due to convergence. This conclusion is underlined by the discovery of *Dacetinops cibdela* Brown and Wilson (1957), a New Guinea myrmicine that is convergent in amazing detail to some of the short-mandibulate Dacetini, although it appears phylogenetically unrelated to either the dacetines or the basicerotines. It is significant in this respect that the most primitive members of

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the basicerotine line (*Basiceros*, *Creightondris*, *Aspididris*) are very different from the primitive living or fossil dacetines (*Daceton* Perty, *Acanthognathus* Mayr, *Hypopomyrmex* Emery). It is only between a few obviously derivative members of these two lines that really close similarities exist.

The real affinities of either Basicerotini or Dacetini within the Myrmicinae are not known at present. *Basiceros* resembles in many ways the enigmatic neotropical *Stegomyrmex* Emery, which is placed by itself in tribe Stegomyrmicini, but there are also obvious and important differences between them. *Stegomyrmex* has very broad frontal lobes, extended forward as well as laterad over the very deep, broad scrobes, its compound eyes are placed below instead of above the scrobes, and its mandibles are different in plan and manner of closing from those of basicerotines. We need to make detailed comparisons of larvae and all adult castes of *Stegomyrmex* with those of representative basicerotines before we can say anything more about their possible relationship. Among fossil ants, there are no known Basicerotini or any other myrmicines which in the light of present knowledge seem close to them.

The present revision recognizes seven genera of Basicerotini in two groups: I) worker and female with 12 antennal segments total: *Basiceros*, *Creightondris*, *Aspididris*; II) worker and female with 7 or 8 antennal segments total: *Octostruma*, *Eurhopalothrix*, *Rhopalothrix*, and *Talaridris*.

#### Characters of the Tribe

**Worker and female:** Small to medium-sized myrmicines with thick, hard integument, normally yellowish, reddish or dark brown in color. Head more or less depressed, broadest across the posterior half, with the lateral occipital borders often produced as prominent angles or as flanges. Sides of head hollowed out into deep, broad scrobes to receive the retracted antennae; rounded posterior and more or less straight ventral scrobe borders distinct and carinate. Compound eyes medium-sized to small (obsolete in a few species) situated on the upper scrobal margins at or a little behind the midlength of the head capsule, usually in the anterior part of the lateral occipital protuberances. Antennae 12-, 8- or 7-segmented; scape bent near base and distinctly flattened dorsoventrally, the subbasal angle

frequently forming a prominent anterior lobe. Clypeus broad, flat or gently convex, more or less triangular, with a transverse (often emarginate) anterior margin and an angulate or narrowly rounded posterior margin.

Mandibles usually approaching porrect; triangular, arcuate-linear or (rarely) bizarre-subtriangular (Fig. 5). If triangular or subtriangular, the masticatory (apical) margins are serially dentate and opposable (Figs. 4, 15); if arcuate-linear, the largest teeth are concentrated at the apices (Figs. 57-63). Labrum prominent and heavily sclerotized, hinged beneath the clypeus so as to project between the mandibles when these are open; often bilobed, more rarely tongue- or shield-shaped. Palpi much reduced by loss of segments and fusion, the maxillary segments numbering 2 or 1, the labials 2 or 1.

In *Basiceros singularis*, the worker maxillary palpus consists of a slender apical segment and a flattened, subrectangular basal segment. The labial palpus is long, slender, bent at the middle, and swollen at base and apex so as to suggest that it is composed of two segments fused.

In *Eurhopalothrix procera*, the worker-maxillary palpus is reduced to a single exceedingly small, slender piece with a bulbous base, bearing a single long sensory seta at its apex. The labial palpus is larger, composed of one slender curved segment, slightly enlarged near base and apex and bearing a single apical sensory seta. The palpi are more than ordinarily difficult to make out in *E. procera*, due to their great reduction.

The palpi of *Eurhopalothrix bolaii* worker are shown in Figure 40.

In *Octostruma inca*, the worker maxillary palpus is two-segmented and consists of a very small globose basal and a longer club-shaped apical segment with a single apical sensory seta. The labial palpus is much more conspicuous but likewise two-segmented. Both segments are greatly elongated, the apical segment bearing 1-2 apical sensory setae.

Alitrunk compact; pro- and mesonotum solidly fused in worker, and metanotal groove distinct to obsolete; propodeum usually armed with a pair of teeth or lamellae. Petiole pedunculate, with a distinct node. Postpetiole short and broad, rounded above, broadly attached to gaster, usually emarginate posteromedially. Gaster compact, dominated by the first segment. Sting sclerotized, functional.

Sculpture varying with genus and species; coarsely rugose-reticulate or -foveolate in some *Basiceros*, ranging to densely and finely reticulate-punctate in some of the smaller *Octostruma* and *Eurhopalothrix*, or more or less granulose, in some small *Rhopalothrix*. Although some species have smooth and shining

areas of the body, all have some definite sculpture as well; none is completely smooth. Generally the head is more coarsely sculptured than the gaster.

Pilosity varying widely with the species, usually bizarre in form: clavate, spatulate, squamiform, globose, curled-lacinate, or combination of these. A few species are nearly completely hairless. A somewhat similar array of bizarre seta types is found in tribe Dacetini, but detailed comparison between superficially similar hairs from dacetine and basicerotine species reveals basic differences in microstructure.

Although ergatoid females are known for a few species, normal queens, fully winged as virgins, are usual. These queens differ from the workers in having ocelli, larger compound eyes, well-developed alary sclerites, antero-posteriorly compressed petiolar node and slightly wider gaster, but, with a few exceptions, chiefly among *Octostruma* species, the female is only slightly larger than the largest workers of her species. The wing venation in both female and male is strongly reduced in both pairs of wings. Figure 8 shows the usual type of forewing for both sexes; the few wings we have seen are all variants on this type. In some *Eurhopalothrix*, the apical spur of *M* disappears, and even *Rs+M* may drop out. *A* commonly ends by curving into *cu—a*, as in Figure 8. *Rs* sometimes reaches the wing margin, sometimes falls short. The crossvein *m—cu* is present in female *Octostruma inca* (Brown and Nutting, 1950: pl. 9, fig. 16, as "*Octostruma* sp.") and *Basiceros convexiceps* (Emery, 1922: pl. 6, fig. 9), thus enclosing a tetragonal "discoidal cell".

Male: known only for *Basiceros convexiceps* (Emery, 1922: 327, pl. 6, fig. 9), for a few species of *Eurhopalothrix* (Fig. 48), and for a few unidentified strays on which Emery based his male characterization of *Rhopalothrix* in the old, broad sense. Donisthorpe's *Rhopalothrix redux*, based on a stray male from British Guiana, is probably a species of *Eurhopalothrix*, *Rhopalothrix*, *Octostruma* or *Talaridris*, but it cannot now be placed any more precisely to genus.

The males bear much the same relationship to the worker and females of the same species as do those of the Dacetini, i. e., the head is much smaller and more convex, rounded behind, with very large eyes and convex clypeus.

Mandibles large, triangular, denticulate in *Basiceros*; more reduced, with either distinct or reduced dentition, in *Eurhopalothrix*. The antennae are 13-segmented, and are inserted

beneath prominent frontal lobes which stand out obliquely from the head surface. The scape is very short, with convexly expanded inner margin, and the first segment of the funiculus is even shorter; the remaining segments are all much longer, evenly cylindrical and nearly equal among themselves, except for the longer apical segment. The shape of the antennae is constant in the *Eurhopalothrix* I have seen, and this constancy extends to the presence of a small but sturdy oblique hair on each inner scape border, directed mesad (Fig. 48). In *Eurhopalothrix*, the under-mouthparts extend a little beyond the mandibles; the labrum is not conspicuous, and the palpi are segmented 1, 1. The palpi of *Basicerus* males have not been checked. In specimens of *Eurhopalothrix* seen, a carina extends along the ventrolateral margin of the gena to a point below the eye; this appears to represent the ventral scrobe margin of the worker.

Notauli present and complete, but not deeply impressed (at least in *Eurhopalothrix*). Petiole and postpetiole tending to be simpler, more slender and more rounded above than in the worker; petiole with slender peduncle. Gaster also more slender, more tapered apicad. Genital capsule slender but compact, fully retractile, of ordinary appearance in *Eurhopalothrix*; parameres narrow, tapered, with bluntly rounded apices; volsellae and aedeagus not varying strikingly from the basic formicid plan, but differing in details from all dacetine genitalia thus far seen.

Body usually somewhat smaller and definitely more slender than in corresponding female; color darker, deep brownish or black. Sculpture densely punctulate-granulose or rugulose-granulose, the gaster smooth and shining or densely punctate-reticulate. Pilosity of simple hairs, rather sparse.

The larvae of the Basicerotini are discussed by G. C. and J. Wheeler (1954 : 111-119, Pls. 6 and 10). They differ from dacetine larvae in lacking bifurcate body hairs. The hairs are curved, tapered, minutely denticulate, and usually come in two sizes. The mandibles each have three well-developed teeth and a few denticles or spinules exist on some part of the surface.

#### Distribution and Ecology

The Basicerotini have a strongly disjunct distribution, split between two parts of the world. In the New World, they range from southern Florida and tropical Mexico south into Bolivia and northern Argentina, with one species known from Cuba. In

the Old World, they are widespread in Melanesia and reach tropical Queensland, New Caledonia, Fiji and Samoa. In the East Indies, the range westward from New Guinea is incompletely known, but the widespread *Eurhopalothrix procera* reaches Borneo, the Philippines and even north to Botel Tobago Island, just off southern Formosa. No basicerotine is yet known from Java, Sumatra or the southeastern Asian mainland. All seven genera are found in the New World, whereas only *Eurhopalothrix* and *Rhopalothrix* occur in the Old World. This distribution resembles that of the ectatommine genus *Gnamptogenys* Roger and the dolichoderine genus *Iridomyrmex* Mayr, which apparently are undergoing centrifugal contraction into peripheral parts of what were formerly very wide ranges in both the Old and New World. As in *Gnamptogenys*, too, the basicerotine stock surviving in the neotropical area is more diversified and includes some types more primitive than any found in the Indo-Australian stock (Brown, 1958).

The present extralimital distribution of the Basicerotini suggests a considerable age for the tribe, perhaps taking it back to the beginning of the Tertiary, before the Panama Bridge was broken. In the absence of a fossil record, however, the time and place of the tribe's origin must remain guesswork.

The basicerotines all come from tropical or subtropical areas, and predominantly from mesic habitats, particularly rain forest, where they live primarily in the upper layers of the soil and in the soil cover, including large and small pieces of rotten wood. They are fairly common in soil cover berlesates. Nests have been found in snail shells and in the peaty masses gathered about epiphytic ferns above the ground level. So far as is known, colonies are small, consisting of one or more dealate — or rarely ergatoid — females, and a few workers. Judging from the structure of workers and females, one would suppose that they were predaceous on small arthropods, and Wilson (1957) has made observations on one New Guinea species, *Eurhopalothrix biroi*, that confirm this species as a predator of certain small, soft-bodied arthropods, particularly entomobryid collembolans. Weber (1950) found a worker of *Basicros singularis* during daylight hours carrying a dead termite in its jaws.

### Revision of Genera and Species

In the sections following, the Basicerotini are revised formally to species level. Keys to the genera and species are all placed together at the end of the revision to facilitate practical identification and to avoid nomenclatorial difficulties in the case of new species.

### Material and Methods

During the course of our work on this tribe, we have been able to examine about 1,000 specimens, a large number considering their rarity in collections. The nucleus of this material is in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts [MCZ], which includes the W. M. Wheeler Collection and a large part of the material collected by Dr. W. M. Mann, as well as types of a majority of the species described as new in this paper. A second important collection, including the majority of Mann's material, is in the United States National Museum at Washington [USNM], and a third is in the care of the junior author [WWK], held at São Paulo, Brazil. This collection comprehends also the extensive collection built up over many years by Father Thomas Borgmeier, O.F.M. [CTB], from many parts of tropical America and elsewhere, now transferred to the care of WWK (see notice in *Studia Ent.*, n.s., 2: 474, 1959). Dr. Neal A. Weber [NAW] of Swarthmore College, Swarthmore, Pennsylvania, has sent us a crucial lot from his personal collection, including types of several forms he described. Other types of W. M. Wheeler and N. A. Weber, mostly duplicates of those we examined from other sources, are in the American Museum of Natural History [AMNH] of New York. Material of two new species was received from the Instituto Miguel Lillo, Tucumán, Argentina [IML], and from Dr. Wolfgang Weyrauch [WW] of Lima, Peru.

The Old World collections are important chiefly because of the types they contain. The British Museum (Natural History) has a few types of Frederick Smith, Forel, Donisthorpe and Santschi, mostly examined by Brown during a visit to London [BMNH] during 1950 and 1952. Types of Carlo Emery were borrowed from the Hungarian National Museum [HNM], and others were compared for us in 1955 by Dr. E. O. Wilson in the Museo Civico di Storia Naturale at Genoa [MCSNG]. In Switzerland, types were loaned us by the Forel Collection in the Museum d'Histoire Naturelle of Geneva [MHNG] and from the Santschi Collection in the Naturhistorisches Museum at Basel [NMB]. Types of Gustav Mayr's species were loaned by the Naturhistorisches Museum in Vienna [NMV]. Some types of Menozzi's species were sent by the late Mario Consani of Florence from his personal collection.

The measurements, and the indices derived from them, are essentially those outlined by Brown (1953 and other papers) in his work on the dacetine ants, and the abbreviations are the same: TL = sum of the axial lengths of the parts of the body, including head and closed mandibles, but not extruded parts of sting or genitalia; HL = axial length of head measured from full-face dorsal view, including all of occipital lobes and clypeus, but excluding mandibles; HW = maximum width of head from full-face dorsal view; ML = distance to which normally closed mandibles project beyond most advanced point or points on clypeus, as seen in dorsal full-face view; scape L = length of scape from extremity of basal lobe or angle to apex; WL = Weber's length of alitrunk, a

diagonal straight-line measurement from anterior face of pronotum to inferior propodeal angles, taken in side view. CI, or cephalic index =  $HW/HL \times 100$ ; MI, or mandibulo-cephalic index =  $ML/HL \times 100$ .

### Acknowledgements

We are indebted to the individuals listed below for aid in making available the material upon which this revision is based. Where the individual gave aid in connection with one of the depositories listed above, the depository is indicated by its initials. Curator Elisabetha Bajári [HNM], Mr. R. B. Benson [BMNH], Dr. C. Besuchet [MHNG], Dr. F. Bonet, Father T. Borgmeier, O.F.M. [WWK], Dr. C. A. Campos Seabra, Dr. J. W. Chapman [MCZ], Sig. M. Consani, Mr. H. S. Dybas [Chicago Museum of Natural History], Dr. M. Fischer [NMV], Father C. Gilbert, O.F.M., Dr. J. L. Gressitt [B. P. Bishop Museum, Honolulu], Dott. D. Guiglia [MCSNG], Dr. N. Kusnezov [IML], Father B. Lowery, S.J., Mr. F. Plaumann, Dr. E. S. Ross [California Academy of Science], Dr. M. R. Smith [USNM], Dr. L. J. Stannard [Illinois State Natural History Survey], Dr. N. A. Weber [NAW], Dr. W. Weyrauch [WW], Dr. E. O. Wilson [MCZ], Dr. I. H. H. Yarrow [BMNH], Prof. K. Yasumatsu [University of Kyushu]. More than half of the figures (Figs. 1, 7, 15-20, 22, 23, 30, 34-48, 56, 57, 59-63) were drawn by Mrs. Nancy Buffler under the senior author's supervision; most of the rest (Figs. 2-6, 8-14, 21, 24-28, 31-33, 58) were done by the junior author. Dr. Wilson helped in all sorts of ways in addition to his fine collections of new and old species; he compared types in European museums and made available his ecological notes on various collections, and he read and criticized the manuscript.

### Major Nomenclatorial Problems at Generic Level

#### a) Application of the Names *Basiceros* and *Creightonidris*

In a preliminary synopsis of the basicerotine genera Brown (1949: 87-91) wrote as follows concerning *Basiceros singularis* Fr. Smith: "The worker as described in Smith's 1858 work should be regarded as the type of the species *singularis* and hence of *Basiceros* as a genus; the female described in 1860 belongs to the genus *Creightonidris*, described as new below, and the female described in the 1858 paper is too poorly characterized and figured to allow placement in either genus with any certainty".

Weber (1950: 5) observed that a "type" placed as *B. singularis* in the British Museum collection was actually an alate female of a *Trachymyrmex* species; he felt that this was due to a mixup occurring in the collection subsequent to Smith's description, and this interpretation certainly seems to be correct. When Brown visited the British Museum in 1950, however, he found that there were five specimens placed in the space labeled



as containing *B. singularis*; two of these were *Trachymyrmex* females, as mentioned by Weber, two were females of the species Brown described in 1949 as *Creighttonidris scambognatha*, and the remaining specimen was a worker of the species that has always been regarded as the true *B. singularis* by Wheeler and others. Brown therefore labeled the worker specimen as lecto-type of [*Meranoplus*] *singularis* Fr. Smith, and we hereby

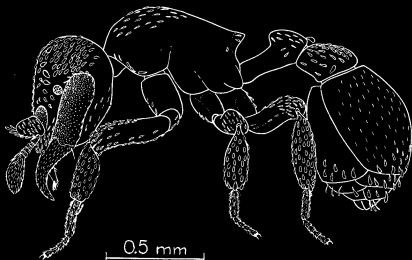


Fig. 1. *Eurhopalothrix biroi* (Szabó), ♀ [N.E. New Guinea: L. Busu R.].

designate it formally as such. The *Trachymyrmex* females cannot have been part of Smith's original series, and these should not be considered further in any discussion of *Basiceros*. One of the two *Creighttonidris* females was probably that described and figured so very poorly by Smith in 1858, and a bit more realistically in his paper in 1860, and they are certainly identical with the Brazilian specimen described as *C. scambognatha*. We have now seen a nest series (from British Guiana) of *Basiceros singularis* with both workers and females present; the female differs from the worker only slightly in size and the usual characters of full sexuality, and the mandibles and other important characters of the species are as in the worker. The 1949 application of the names in question is thus formally stabilized.

b) Application of the Name *Rhopalothrix*

When *Rhopalothrix* was first described by Mayr in 1870, that author included only the two new species, *R. ciliata* and *R. bolaui*. *R. ciliata* was never taken a second time, and apparently no one else has examined the types up to the period of the present work. Nevertheless, the species was chosen as type of *Rhopalothrix* by Wheeler in 1911, by which time several additional species had been added to the genus. In 1912 Forel proposed a subgeneric split, in which the species with 8 antennal segments were placed in the new subgenus *Octostruma*, while all the 7-segmented forms went into *Rhopalothrix* s. str. After that, during the next 30 years, species were added a few at a time by various authors, who assigned them to either subgenus accordingly as they had 7 or 8 antennal segments. Brown (1949) raised *Octostruma* to generic rank, separate from *Rhopalothrix*, but did not critically examine all of the species of either of these two genera.

It therefore came as a surprise to us when we finally examined types of *ciliata*, that this species was quite different from all the other forms until now placed in *Octostruma* or *Rhopalothrix*. Instead, in its linear mandibular form and peculiar dentition, *ciliata* was like Weber's two monotypic genera *Heptastruma* and *Acanthidris*, which we had already decided represented only one genus, to include also four new species (see below, under genus *Rhopalothrix*). After careful consideration, it was concluded that *Rhopalothrix*, as based on the type species *ciliata*, was congeneric with the type species of *Heptastruma* and *Acanthidris*, as well as the four new species *plaumanni*, *kusnezovi*, *diadema* and *stannardi* (Figs. 57-60).

Following strict priority, it was clear that *Rhopalothrix* would have to supplant the names *Heptastruma* and *Acanthidris* for the narrow-mandibulate forms, while the triangular-mandibulate forms with 7 antennal segments, formerly called *Rhopalothrix* s. str., were left without a name. For a time, we considered applying to the International Commission for Zoological Nomenclature in order to attempt fixation of the application of *Rhopalothrix* in the traditional sense by choosing a new genotype. However, at least two currently active ant taxonomists opposed conservation in this case, and one of the International Commissioners advised us privately that conservation did not seem necessary for a genus like *Rhopalothrix*, which had not entered prominently into the literature outside pure formicid systematics.

Everything considered, we feel it wise to follow strict priority despite the confusing nature of the shift in application of the name *Rhopalothrix*. The 7-segmented forms, still held to be generically distinct from *Octostruma*, will take the new name *Eurhopalothrix* (see below).

### Basiceros Schulz

*Meranoplus*, Fr. Smith, 1858: 195, nec Fr. Smith, 1853.  
*Ceratobasis* Fr. Smith, 1860: 78 (*praecoc.* Lacordaire, 1848). Type: *Ceratobasis singularis* = *Meranoplus singularis* Fr. Smith, 1858, monobasic.  
*Basiceros* Schulz, 1906: 156, nom. pro *Ceratobasis*.  
*Basiceros*, Emery, 1922: 327, diagnosis and catalog.  
*Basiceros*, Brown, 1949: 87 (+ 1 species), discussion, synonymy.

Worker and female: Size medium. Head trapezoidal or oblong, not disc-like, with separate occipital and lateral borders, the borders not produced into a continuous or near-continuous flange or crest around the back of the cranium. Eyes well developed in worker. Mandibles sub-porrect, triangular, with straight, opposable, multidenticulate masticatory borders; blade narrowed to peduncle before insertion, so that a large interspace between basal mandibular and anterior clypeal borders is present, framing the large labrum. Antenna with flattened, moderately lobate scape and 11 segments in the funiculus. Metanotal groove present. Propodeal teeth short, more or less acute, connected by a transverse carina. Gastric dorsum with a median longitudinal strip impressed or devoid of pilosity. Pilosity conspicuous and bizarre; reclinate ground hairs abundant, spatulate, squamiform or pennant-shaped; erect hairs clavate or stout and truncate. Labrum with fine sense hairs. Integument thick and dense, mostly sculptured; foveolate-rugose over head, densely punctate over most or all of gaster. Color brownish-red or brown.

We have examined no males of this genus; male characters are discussed in the tribal diagnosis, above. Larvae (after G. C. and J. Wheeler) moderately stout; thorax and first two abdominal segments not constricted to form a long "neck". Of the two types of denticulate hairs, the larger one has a fine, tapered, not hook-like apex.

The three species of *Basiceros* have separate ranges within the neotropical area: *manni* is in Central America, *singularis* in hylaeian South America, and *convexiceps* in southeastern Brazil. It is not known whether any of these ranges overlap. Apparently the genus was once more widely and continuously distributed in the New World. The record of a "*Basiceros* sp." from New Guinea (Donisthorpe, 1948, Ann. Mag. Nat. Hist., ser. 12, vol. 1, p. 131) cannot be accepted here. Donisthorpe

never stated his reasons for believing that the specimen from New Guinea belonged to *Basiceros*, and the specimen cannot now be found. The species of *Basiceros* live in rain forest and probably nest mainly in rotten wood. As already mentioned above, *B. singularis* has been seen carrying a dead termite. This species and *B. manni* (as well as some specimens of *Aspididris discigera*) often have the integument and pilosity heavily fouled with a crust of some light-colored granular material that is not appreciably affected by the common organic solvents, or even by fairly strong concentrations of mineral acids. One wonders whether this is a secretion produced by the ants themselves, or perhaps is dried defensive secretion of nasute termites.

*B. convexiceps* is so different from *B. manni* and *B. singularis* that it could be placed in a genus by itself. The species of the lower genera (*Basiceros*, *Aspididris*, *Creightonidris*) are evidently old relicts, most of which have had time to become differentiated rather strongly as compared to most species of the higher genera. Nevertheless, we retain *convexiceps* in *Basiceros* for the time being, because we believe that there may well remain species in this group that have not yet been collected, but which may strongly affect generic limits.

### ***Basiceros convexiceps* (Mayr)**

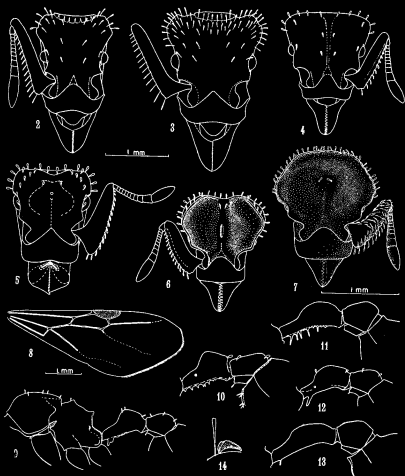
(Figs. 4, 12)

*Ceratobasis convexiceps* Mayr, 1887: 581, worker. Type locality: Santa Catarina, Brazil. Holotype in NMV, not seen.  
*Basiceros convexiceps* Emery, 1922: 328, pl. 6, fig. 9, male.  
*Basiceros squamifer* Borgmeier, 1937: 245, figs. 30-33, worker, female, larva. Type locality: Jussara, near Angra dos Reis, Rio de Janeiro State, Brazil. Syntypes WVK and MCZ [from CTB], many examined. NEW SYNONYMY.

**Worker:** TL 6.0-6.2, HL 1.23-1.34, HW 1.23-1.30 (CI 97-100), WL 1.66-1.77 mm, MI 39-44.

Mandibles with sinuous outer borders, masticatory borders each with about 14 separated, small, triangular teeth. Clypeo-mandibular interspace short, more than twice as broad as long. Labrum long, cuneiform, tapering apicad, with a distinct median longitudinal dividing groove. Cranium trapezoidal, vertex and occiput evenly and continuously convex in both directions, except for a distinct but shallow median longitudinal sulcus. Occipital border straight in full-face view; cervical border with a scarcely-developed lamellar margin, not visible from full-face dorsal view.

Promesonotum high and rounded, with a fairly distinct promesonotal suture; propodeum at a lower level and separated from promesonotum by a strong metanotal groove. Petiole and postpetiole as in Fig. 12; note the single strong anteroventral spiniform process of petiole. Propodeal dorsum convex, teeth short and triangular. First tergite of gaster with a shallow, often indistinct, median longitudinal impression or sulcus.



*Basicerus, Creightonidris and Aspididris*

Fig. 2. *B. singularis* (Fr. Smith), ♂ head [Brit. Guluana: Kurupung]. — Fig. 3. *B. manni*, n. sp., ♀ head [paratype]. — Fig. 4. *B. convexiceps* (Mayr), ♀ head [paratype of syn. *squamifer*]. — Fig. 5. *C. scambognatha* Brown, ♀ head [holotype]. — Fig. 6. *A. discigera* (Mayr), ♀ head [Seara, SC]. — Fig. 7. *A. militaris* Weber, ♀ head [paratype]. — Fig. 8. *C. scambognatha* Brown, ♀ forewing [holotype]. — Fig. 9. *A. discigera* (Mayr), ♀ thorax and pedicel in profile. — Fig. 10. *C. scambognatha* Brown, ♀ pedicel in profile. — Fig. 11. *B. manni*, n. sp., ♀ pedicel in profile. — Fig. 12. *B. convexiceps* (Mayr), ♀ pedicel in profile. — Fig. 13. *B. singularis* (Fr. Smith), ♀ pedicel in profile. — Fig. 14. *B. manni*, n. sp., ♀ clavate and pennant-shaped hairs (greatly enlarged). — (All figures, except 7, 8 and 14, drawn to the same scale; scale for figures 7 and 8 are indicated).

Head, promesonotum and both nodes with coarse crowded punctures or foveolae, each containing a small spatulate reclinate hair; spaces between punctures, especially on head, forming rugulae. Mandibles smooth and shining, with spaced punctulae. Scrobes finely shagreened, with indistinct transverse costation.

Sides of alitrunk, all of propodeum, and petiolar peduncle feebly and very finely shagreened, almost smooth, definitely but moderately shining. Legs and scapes very finely and densely punctulate or shagreened, opaque. Gaster with fine, dense cribrate punctation; interspaces narrow but shining, so that the whole surface is feebly shining to subopaque; punctation effaced on anterior part of first gastric sternite, this area smooth and shining.

Erect clavate hairs of head arranged as in Fig. 4; note the tendency for the hairs to be grouped in three transverse rows. Pronotum with one or two clavate hairs on each humerus and a pair on mesonotum. Nodes each with two pairs of posteriorly inclined clavate hairs, and postpetiole with a ventral pair of curved clavate hairs. Gaster with about 8 erect clavate hairs in two longitudinal rows, one on each side of gastric sulcus, on first tergite; the most posterior pair may be flanked on each side by an additional outer pair, so that a row of four is formed along the posterior border of the segment. Apical segments with another 20-30 small erect clavate hairs. Hairs fringing scapes shown in Fig. 4. Ground pilosity consisting of short, thick, white squamiform hairs, mostly reclinate, abundant over head, promesonotum, posterior part of propodeal dorsum, parts of coxae, nearly all of legs, upper scape surfaces and both nodes; sparse on gaster; on clypeus, gula and tarsi, the reclinate hairs are relatively fine and inconspicuous. Color brownish-red. No deposit on integumental surface of the available specimens.

**Female:** TL 7.0-7.1, HL 1.37, HW 1.34 (CI 98), WL 1.95 mm. Alary sclerites coarsely rugose, the mesonotum longitudinally so. Erect hairs of gastric dorsum more abundant than in worker, there being 20-24 or more on first tergite, arranged in 2-3 rough longitudinal rows on each side of median sulcus. Wings unknown.

**Male:** Known to us only from the generic diagnosis given by Emery (1922), who cites the following characters: Clypeus projecting anteriad. Frontal carinae short, ear-like. Mandibles long, projecting as "disc-like" blades, their outer borders convex, masticatory borders multidenticulate. Antennae long, first funicular segment very short. Emery pictures the forewing in Pl. 6, fig. 9.

**Variation and synonymy.** — Apart from slight proportional differences, the workers available show weak variation in the pattern of

cephalic rugulosity and in presence or absence of individual hairs, the latter due in part to abrasion. The gastric sulcus varies in distinctness. Borgmeier distinguished *B. squamifer* from *B. convexiceps* chiefly on the basis of proportional differences in the postpetiole as indicated by Mayr's description. It now seems clear that the original description was merely rather loose in its approximation of the true proportions of the postpetiole, and that there is no real difference between the types of the two species. Furthermore, the Santa Catarina specimen from the Emery Collection matches the *squamifer* types very closely.

**Material examined.** — One worker [MCZ] from Santa Catarina State, Brazil, without further locality or collector's label, received long ago by Prof. Wheeler from the Emery Collection. 60 workers and 3 dealate females [CTB, MCZ] from Jussara, Rio de Janeiro State, Brazil (H. Souza Lopes and H. Lent leg.), syntypes of *B. squamifer*.

**Remarks.** — In many of its features, *B. convexiceps* appears to be the most generalized member of its tribe. Not only can the other *Basiceros* species, *Aspididris* and *Creightondris* be derived from an ideal stock much like *B. squamifer*, but species in the higher genera also show clear relationship in characters such as labral form, general shape of head, median gastric sulcus and arrangement of pilosity.

The Jussara series was taken in a large rotting log, under the bark and in the wood proper. The presence of the three dealate females suggests that the colony was polygynous.

### ***Basiceros singularis* (Fr. Smith)**

(Figs. 2, 13)

*Meranoptus singularis* Fr. Smith, 1858: 195, pl. 13, figs. 6-10, worker *nec* female. Type locality: None given with original description, but by inference from Fr. Smith, 1860, *loc. cit. infra*, it is Ega — Tefe, Amazonas State, Brazil. Lectotype, by present selection, is the worker so labeled by Brown in BMNH (examined). *Ceratobasis singularis*, Fr. Smith, 1860: 78, pl. 4, figs. 12, 13, worker *nec* female. *Basiceros singularis*, Wheeler, 1916, Bull. Amer. Mus. Nat. Hist., 35: 9, female (no description). British Guiana: Tukeit and Kaietur. — Brown, 1949: 88, discussion. — Weber, 1950: 5, discussion and biology; Northern Range, Trinidad; Oronoque River, British Guiana.

**Worker:** TL 7.5-8.6, HL 1.52-1.69, HW 1.09-1.25 (CI 70-74), WL 2.14-2.41 mm, MI 36-43.

Shape of head shown in Fig. 2. Occiput depressed, leaving vertex and upper part of frontal area raised and convex, but with a small central pit or impression. Mandibles with numerous (about 18) crowded denticulae; clypeo-mandibular interspace about 2/3 as long as broad. Labrum broader than long, with broadly rounded apex and no discernible median longitudinal notch or groove.

Alitrunk slender, of the "sway-back" type, with long, high, rounded promesonotum, sloping down behind into a broad, deep, round-bottomed metanotal groove. Propodeum much narrower, with short, acute, slightly upcurved teeth. Petiole (Fig. 13)

clavate, very long and low, with one strong spiniform anteroventral process, sometimes with one or two abortive denticulae behind this in line. Postpetiole subcircular as seen from above, truncate in front, very slightly longer than broad and a little broader than petiolar node. Gaster with a whitish, upturned lamelliform anterodorsal margin. No mid-dorsal sulcus or impression developed, but a broad median strip of integument is free of pilosity. First sternite with a short, sharp median carina extending caudad from its basal border.

Head irregularly rugose, with coarse piligerous tubercles; clypeus with coarse but shallow piligerous punctures; scrobes almost smooth, feebly shining. Gula granulose-punctulate, with larger, crowded, coarse piligerous punctures superimposed. Alitrunk, legs and both nodes with coarse piligerous tubercles, between these the integument is smooth and shining when clean. Some short costulae on sides of mesonotum give way behind to a shining, coarsely punctate area on lateral propodeal faces. Mandibles punctulate but shining; petiolar peduncle, labrum and scapes very finely reticulate-punctate, but with smooth and shining interspaces. Integument usually so heavily encrusted with the peculiar adhering material characteristic of this species and *B. manni* that the details of sculpture and ground pilosity are covered up.

Where details of the pilosity can be seen, the ground pilosity is rather sharply differentiated from the erect pilosity. Basal 2/3 of upper mandibular surfaces, basal half of labrum and lobes of frontal carinae thickly set with small, white appressed hairs in the form of elongate scales. Similar but narrower hairs in clypeal punctures. Ground hairs of rest of head, all of alitrunk (except naked areas on middle and posterior sides of this tagma), both nodes, gaster (except sides), and coxae are predominantly of a peculiar, arched pennant-shaped type (Fig. 14) with broad basal portion and fine, tapered, undercurved and slightly lacinate apical part. Along the lower margins of the pronotum is a dense border of curved, thickened spatulate hairs; legs and scapes densely covered with decumbent spatulate hairs having a somewhat puffed and feathery surface. Erect hairs (Fig. 14) long, slender, clavate with subtruncate apices, numerous on both surfaces of head behind, on promesonotum, under prothorax, on both nodes and gaster. Fine tapered hairs on apices of tarsi and of gaster, and fringing free labral border. Color deep brownish-red or reddish-brown.



**Female:** TL 8.7, HL 1.61, HW 1.17 (CI 73), WL 2.54 mm. MI 42. Mesonotum and lower posterior sides of alitrunk with longitudinal rugae; scutellum punctate-rugose. Otherwise with only the usual caste differences. Male unknown.

**Variation.** — No unusual variation was noted; however, the different degrees to which workers are encrusted with hardened material can produce considerable variation in the general appearance of different specimens.

**Material examined.** — The lectotype worker [BMNH], presumably collected by H. W. Bates at the present Tefé, in Amazonas State, Brazil. From British Guiana, we have seen 11 specimens [CTB, USNM, MCZ] from the following localities: Kaietur (F. Lutz leg.), 1 worker; Kurupung (H. O. Lang leg.), 8 workers; Kartabo (W. M. Wheeler leg.), 1 worker, 1 female.

**Distribution and ecology.** — Weber (1950) reports this species from the Oronoque River in British Guiana and from the Northern Range on Trinidad. The ant is apparently widespread in the Amazon-Guianas area. It lives in rain forest and forages by day.

### ***Basiceros manni*, sp. nov.**

(Figs. 3, 11)

**Holotype worker:** TL 8.0, HL 1.63, HW 1.30 (CI 80), WL 2.25 mm. Mandibulo-cephalic index 38. Paratype workers: TL 7.7-8.3, HL 1.59-1.70, HW 1.30-1.48 (CI 80-87), WL 2.17-2.35 mm. MI 36-41. Very similar to *B. singularis*, but with the head (Fig. 3) broader across the occiput, and the sides correspondingly more divergent behind. Also the following differences as compared to *singularis*:

1. Mandibles with about 20 small, crowded, blunt denticles, gradually diminishing in size basad along masticatory border of mandible.

2. Basal halves of mandibles without dense, appressed squamiform pilosity, their surfaces generally smooth and shining. Appressed ground pilosity of labrum inconspicuous, almost obsolete. Clypeus with very short squamose hairs, entirely contained within their foveolae.

3. Large erect hairs on cranium, alitrunk, petiole, postpetiole and gaster more abundant and widespread.

4. Curved irregular pennant-shaped hairs of ground pilosity less abundant, absent entirely from gular surface of head; present along lateral and posterior borders.

5. Petiole (Fig. 11) with a slightly thicker node; beneath with 4-7 irregular, variable, acutely spiniform, ventrally-directed processes, and often with one or more vestigial processes as well.

6. First gastric sternite without an anterior median longitudinal carina.

Paratype females: TL 8.1-8.4, HL 1.63-1.70, HW 1.34-1.41 (CI 82-83), WL 2.32-2.35, forewing L ca. 6.1 mm. MI 38. With the usual caste differences from worker. Wings brownish.

Material examined. — Holotype worker [USNM] one of a nest series of 20 workers and 2 females from Hamburg Farm, Santa Clara Province, Costa Rica, 1924 (F. Nevermann leg.). The additional paratypes are 6 workers from Columbiana Farm, Costa Rica, March, 1920 (W. M. Mann leg.); and 2 workers from Songrelaya, Honduras, May, 1924 (Mann leg.). Paratypes in USNM, WWK, MCZ and elsewhere. The paratype workers show no notable variation from the holotype, except in the slight differences in mensurable characters as given above. The name is given in honor of Dr. W. M. Mann, who first discovered this species and recognized that it was undescribed.

### Creightonidris Brown

= *Creightonidris* Brown, 1949: 89. Type: *Creightonidris scambognatha* Brown, 1949, by original designation, monobasic.

Winged female (worker and male unknown): Size and habitus of *Basiceros*; antennae 12-segmented. Mandibles aberrant, not pedunculate, their basal borders closing against the clypeus; basal halves convex and broad, each with a deep oblique cleft extending outward from the masticatory margin; apical halves bent sharply ventrad, triangular, flat, their straight masticatory margins serially dentate (Fig. 5).

Only the single Brazilian species is known.

### *Creightonidris scambognatha* Brown

(Figs. 5, 8, 10)

*Creightonidris scambognatha* Brown, 1949: 89, female. Type locality: Campinas (now a suburb of Goiânia), Goiás State, Brazil; holotype CTB.

*Meranoplus singularis* Fr. Smith, 1858: 195, female *nec* worker. Type locality: Ega (now Tefé), Amazonas, Brazil; lectotype by present selection, is the worker so labeled in BMNH.

*Ceratobasis singularis*, Fr. Smith, 1860: 78, female *nec* worker.

This species remains known only in the female caste, a detailed description of which was given by Brown, 1949. The TL was there given as 7.4 mm, but the gaster is expanded about 0.4 mm, so that 7.0 mm, would be a more reasonable approximation of TL.

Material examined in addition to holotype: 2 females in BMNH from Ega (= Tefé), Amazonas, of which one is lectotype (H. W. Bates leg.). A single winged female (MCZ) from Igarapeaçú, Pará State (C. R. Gonçalves leg.).

### **Aspididris** Weber

*Aspididris* Weber, 1950: 3. Type: *Aspididris militaris* Weber, 1950, by original designation, monobasic.

This genus, known from workers and females, includes two neotropical species with the basic characters of *Basiceros*, but in which the posterior half of the head has been transformed into a disc-like structure, with the vertex convex, but the lateral and posterior occipital borders drawn out into a sharp, upturned, saucer-like margin that is ornamented with a row of clavate hairs. In *A. militaris*, this margin is continuous around the back of the head, from near one compound eye to the other, while in *A. discigera*, it is slightly interrupted posteromedially (Figs. 6, 7). *A. discigera* has been placed in *Basiceros* by previous authors, and it is clearly transitional in head shape between a species like *B. convexiceps* and the extreme *Aspididris militaris*. Thus, while the generic split seems almost academic, the distinction can still be drawn rather clearly on a practical basis, and there seems to be no good reason to synonymize *Aspididris* unless further intergradient species are found.

The Wheelers have shown that the larva of *A. militaris* is very similar to that of *Basiceros*. The two *Aspididris* species are known from Trinidad and southeastern Brazil, and both are uncommon. We have no biological data on them beyond the fact that they are collected in moist forested areas.

### **Aspididris discigera** (Mayr) comb. nov.

(Figs. 6, 9)

*Ceratobasis disciger* Mayr, 1887: 581, worker. Type locality: Santa Catarina State, Brazil. Holotype in NMV, not seen.  
*Basiceros discigera*, Emery, 1922: 328.

Worker: TL 5.1-5.8, HL 1.19-1.32, HW 1.09-1.25 (CI 91-94), WL 1.34-1.46 mm, MI 27-30. The figures show the form of the head and other characters as drawn from a topotypic specimen of this species. It may be noted that the central convexity of the head shield is narrower and less even than in *A. militaris*, also that the convexity is confluent with the posterior border at

a median emargination of the border, thus broadly interrupting the broad sulcus running around the occipital border just inside its raised margin. Note also that the median pit of the vertex is more distinct, and the median pair of hairs situated farther back than in *A. militaris*.

Alitrunk and nodes shown in Fig. 9. Propodeum with a variable anterior tumulus, behind this concave from side to side, and meeting the declivity at a fine, curved carina. Petiole with an irregular and variable anteroventral process, and often one or two smaller teeth behind this.

Head above shining, with abundant, spaced, coarse punctures; cervical face of occiput and antennal scrobes densely punctate, weakly shining to opaque. Underside of head with coarse piligerous foveolae. Mandibles smooth and shining. Dorsum of alitrunk and nodes largely vermiculate-rugulose to reticulate-rugulose; sides of alitrunk punctate in front, passing into a smooth and shining area on the lower posterior sides. Concave parts of propodeum, dorsum of gaster, and coxae cribrately punctate, opaque or subopaque; underside of gaster more sparsely punctate and shining, especially in the middle. Legs and antennae densely and finely granulose-punctulate, opaque to subopaque.

Ground pilosity consisting of decumbent linear-spatulate hairs densely arranged over legs and upper scape surfaces; more sparsely on gula, inferior pronotal borders, dorsolateral propodeal margins, both nodes; very sparse on gastric dorsum (posterior part) and promesonotum (posterior part). Erect spatulate hairs of head shown in Fig. 6; alitrunk with up to 15 or 16, 20-40 or more on gastric dorsum, one hair each on upper faces of hind coxae. Fine tapered hairs on mandibular apices and labrum. Color deep reddish-brown, appendages lighter.

**Female:** TL 6.1-6.4, HL 1.30-1.34, HW 1.20-1.30 (CI 92-97), WL 1.63-1.70 mm, MI 32-33. With the usual caste differences from worker. Wings unknown.

**Material examined.** — 36 workers and 2 females, all strays taken in Berlese funnel samples during the years 1954-1960 in southern Brazil. Rio Grande do Sul State: Nova Petrópolis (F. Plaumann leg.) 6 workers; Santa Catarina State: Nova Teutônia, Seara, Morro do Serro, Chapecó (F. Plaumann leg.) 16 workers, 2 females; Paraná State: Rio Azul (F. Plaumann leg.) 8 workers; São Paulo State: Agudos (C. Gilbert leg.) 3 workers, Cantareira Mountains nr. São Paulo City (W. Kempf & V. dos Santos leg.) 3 workers. [WWK, CTB, MCZ, USNM].

**Aspididris militaris** Weber

(Fig. 7)

*Aspididris militaris* Weber, 1950: 3, fig. 1, female, worker. Type locality: Nariva Swamp, Trinidad, West Indies.

Holotype female in AMNH; paratypes workers NAW and MCZ.

Paratype worker: TL 5.8, HL 1.40, HW 1.31 (CI 90), WL 1.46 mm, MI 27. Head shape shown in Fig. 7. Note the continuously rounded occipital border, the fully continuous broad sulcus running around the occiput inside the raised margin, and the more evenly and broadly rounded central convexity of the head shield. Alitrunk, petiole, postpetiole and gaster all proportionately more robust than in *A. discigera*, and more rounded in their outlines. Petiolar peduncle with several (5) irregular teeth or processes beneath. Median dorsal sulcus of gaster much less distinct than that of *A. discigera*.

Body shining nearly throughout, the dorsal surfaces with coarse separated punctures, denser and smaller on gaster; alitrunk not rugose above. Pilosity of scapes and legs much as in *A. discigera*, but elsewhere less abundant. The paratype worker available to us has only a few erect or reclinate spatulate hairs on the body behind the head, but it may be partly depilated. Many of the punctures on the gastric dorsum enclose a single short, fine appressed hair. Color deep brownish-red.

Female (holotype) not seen; male unknown.

Material examined: a single worker paratype. The species remains known only from the type series from Trinidad.

**Octostruma** Forel

*Rhopalothrix* subgenus *Octostruma* Forel, 1912: 196. Type: *Rhopalothrix simoni* Emery, 1890 (= *Rhopalothrix jheringi* Emery, 1887), by designation of Wheeler, 1913. — Emery, 1922: 328, diagnosis and catalog (*Rhopalothrix petiolata* wrongly cited as type species).

*Octostruma*, Brown, 1948: 102, 125, in key; 1949: 92, discussion, list of spp.

Worker and female: Medium-small to small species, compact in form. Mandibles triangular, with 6-12 serially arranged triangular teeth; masticatory borders meeting at full closure. Antennae 8-segmented, the apical funicular segment very long and thick; scape angled near base, and usually lobate here also, with a fringe of clavate or spatulate hairs along the free anterior margin. Head broad behind, but the lateral occipital lobes in most species less angulate and less strongly projecting than in

*Eurhopalothrix*. Labrum prominent, movable as in the other genera, apically bilobate and furnished with sense hairs.

Ground pilosity usually poorly to moderately well developed; erect clavate or spatulate hairs arranged in a symmetrical pattern of 6 or more on upper dorsum of head; often similar hairs on gaster and sometimes paired on alitrunk and nodes. Sculpture mainly densely punctulate; some species have coarser, more rugose head sculpture, or else have sculpture partly effaced and nearly smooth. Color light ferruginous to blackish-brown.

Male not seen.

So far as is known, *Octostruma* is entirely confined to the New World, where it is found in or near tropical forest from Mexico and the West Indies south to northern Argentina. It nests and forages in rotten wood, leaf litter, in the soil, or even in epiphytes. The small eyes in the workers of most species lead to the belief that the foraging must be cryptic in large part.

As treated here, *Octostruma* contains nine species in two groups. The *petiolata* group consists of three little-known relict forms that appear to have restricted ranges, plus the very widespread *O. jheringi*. The *balzani* group consists of *O. balzani*, a widespread and dominant species, and four close relatives. Three of these relatives have ranges peripheral to that of *balzani* in general, and they appear to form a centrifugal-speciation system with it.

#### Group of *petiolata*

This group is really an assemblage of convenience, containing the neotropical species left after subtracting the *balzani* group. The species vary widely in sculpture, and in at least two of them (*inca*, *petiolata*), female caste dimorphism is more extreme than in other members of the tribe, the queens being exceptionally large and bulky compared to the workers. The difference is not great, however, when one compares the dimorphism with that of other myrmicine tribes, i. e., Pheidolini.

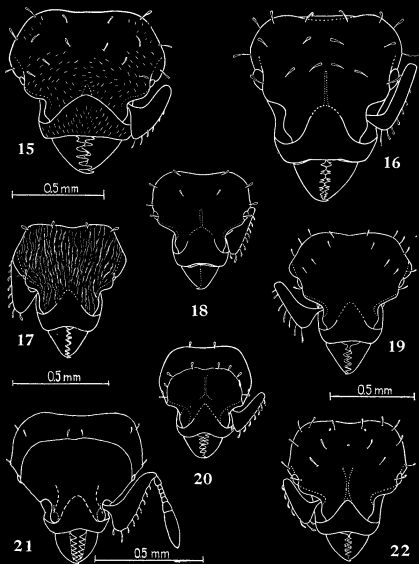
#### *Octostruma petiolata* (Mayr)

(Figs. 15, 23)

*Rhopalothrix petiolata* Mayr, 1887: 580, female. Type locality: "St. Catharina", Brazil. Types in NMV.

*Rhopalothrix petiolata*, Emery, 1894: 80, 81, worker, associated with female in nest in snail shell from the state of São Paulo.

Worker (6 specimens, from two different localities): TL 3.3-3.5, HL 0.74-0.78, HW 0.85-0.90 (CI 114-117), WL 0.89-0.92 mm.



*Octostruma* Forel: head (ground pilosity omitted in all figures except Fig. 15 where it is shown in part only). — Fig. 15. *O. petiolata* (Mayr), ♀ [São Paulo]. — Fig. 16. *O. Inca*, n. sp., ♂ [paratype]. — Fig. 17. *O. jheringi* (Emery), ♀ [holotype of syn. *simoni*]. — Fig. 18. *O. balzani* (Emery) ♀ [lectotype]. — Fig. 19. *O. batesi* (Emery), ♂ [holotype]. — Fig. 20. *O. rugiferoides*, n. sp., ♀ [holotype]. — Fig. 21. *O. rugifera* (Mayr), ♂ [Nova Teutônia, SC]. — Fig. 22. *O. balzani* (Emery), ergatoid ♀ [Mexico: Chiapas]. — (Scales: Fig. 16 as Fig. 15; Figs. 18, 20, 22 as Fig. 19).

Female, alate (3 specimens, including 2 syntypes): TL 5.2-5.5, HL 0.98-1.00, HW 1.14-1.20 (CI 116-120), WL 1.45-1.53, forewing L 4.7-5.1 mm.

This species, described from the female caste, has workers so different in habitus, and especially in sculpture and ground pilosity, that only examination of the workers and female associated by Emery (*loc. cit.*) from "S. Paulo" (von Jhering leg.) finally convinced us that they belong together. Curiously, Emery's characterization of the worker does not bring out the outstanding differences. In addition to the size and head form differences (Figs. 15, 23), the worker has the head, alitrunk and both nodes very minutely and superficially shagreened, so that the surface is smooth but opaque. The gaster is more lightly shagreened and is weakly shining to subopaque, with feeble punctulation over the surface. The female has the head and pronotum distinctly vermiculate-rugulose; scutum longitudinally subcostulate and shallowly punctate; scutellum transversely rugulose. The nodes are shagreened, with weak punctation, and the gaster is densely and finely punctate and opaque. The alitrunk is very convex, both from front to rear and from side to side in the worker; the dorsal sutures are absent in the two worker specimens seen, but the dorsum of the propodeum forms a slight angle with the promesonotum where they join. Propodeal teeth short and triangular in both female and worker. The six workers seen had the erect clavate hairs confined to the head, scapes, legs and gastric apex and venter, but the dorsal surfaces of the body, except the upper central part of the head, have abundant fine appressed hairs. A pair of fine long hairs anteromedially on first gastric sternite. The female has, in addition to the rather abundant appressed ground pilosity and erect clavate hairs of head and gastric apex, a few slender clavate hairs on the scutum, many on the gastric venter, and two irregular longitudinal groups of about 8 hairs each on each side of the gastric midline. Male unknown.

Material examined, in addition to two syntypes: a worker and associated winged female from "S. Paulo", (von Jhering leg.) in the Emery Collection at Genoa, and 5 workers from Itajubá, Santa Catarina, Brazil (F. Plaumann leg.) [WWK, MCZ].



***Octostruma inca*, sp. nov.**

(Figs. 16, 29)

**Holotype worker:** TL 4.2, HL 0.92, HW 0.91 (CI 99), WL 1.12 mm. Form of head and alitrunk shown in the figures. Disc of clypeus somewhat convex, posterior border of median lobe distinct. Front and vertex with occiput gently convex in both directions. Antennal scrobe very shallow, set off above and below by rather feeble margins. Eyes large for an *Octostruma*, with 8-9 facets across the greatest diameter. The gentle emargination of the occipital excision is partly filled in by a narrow lamina or carina that is visible in full-face view. Scape strongly bent at base, but not greatly broadened and without a marked lobate expansion at the bend. Funicular segment I distinctly longer than broad, II-IV about as broad as long, VII (apical) slightly shorter than I-VI combined. Palpi 2:2 (cf. Characters of the Tribe).

Mandibular blades sharply and densely reticulate-punctate at base, shining and nearly smooth at apex; when closed, basal borders engage anterior clypeal border their full lengths; masticatory border with 8 larger subtriangular teeth, smaller and more acute toward the apex, larger and more blunt basad; after the second, third and fourth teeth from the base, there is a shorter acute denticle.

Promesonotal suture obsolescent; metanotal groove distinct but narrow. Dorsal face of propodeum with a rather strong median longitudinal ruga that forks posteriad to join the propodeal teeth, which in this species are low and not distinguishable from the body of the infradental lamellae guarding each side of the propodeal declivity.

Petiole with peduncle about as long as its node; antero-ventral process of peduncle oblique, blunt. Dorsal face of node transverse, submarginate at the sides, sloping posteriad, rather flat. Postpetiole about  $1\frac{1}{2}$  times as broad as petiolar node; seen in profile rather flat above over the anterior  $\frac{2}{3}$ , the posterior limb curved downward. Gaster broader than head.

Head, alitrunk, petiole and postpetiole densely and finely reticulate-punctate, the head (especially toward the sides and occipital corners) with a superimposed open network of fine rugae; sparse rugae superimposed on promesonotum, where they form a reticulum, and along posterior pleura and dorsal face of propodeum, where they are more or less longitudinal. The

discs of both nodes, as well as the coxae are indistinctly rugose over their punctulation. Legs otherwise, and scapes, finely and densely punctulate. Gastric dorsum covered with fine, separated punctulae, the interspaces more or less shining, so that the surface is subopaque.

Ground pilosity consisting of minute, slightly broadened, recumbent, yellowish hairs, mostly inconspicuous on body, more evident on pedicellar nodes and gaster, quite distinct on legs and scapes. Specialized erect hairs long, narrowly clavate, distributed on head and alitrunk as shown in Figs. 16 and 29; a pair on posterior petiolar node; 6 on postpetiolar node (4 on posterior border); about 24 on first gastric tergite, in rough rows, and a transverse row on each apical tergite, plus several on gastric sternites. Shorter clavate hairs on tibial apices, mostly recumbent. Anterior scape border with 7-8 clavate hairs, decreasing in size from basal lobe to apex. Ferruginous; disc of postpetiole slightly darker.

Holotype worker with 14 paratype workers from an unknown locality in Peru, probably on the Amazon drainage (W. Weyrauch leg., No. 732). Holotype in WWK, paratypes WWK, MCZ, IML, WW. Paratype workers: TL 3.6-4.2, HL 0.81-0.92, HW 0.78-0.91 (CI 96-99), WL 0.96-1.12 mm. The paratypes agree with the holotype in all essential respects apart from absolute measurements; some are a little more brownish in color.

Female: TL 5.9, HL 1.03, HW 1.11 (CI 108), greatest diameter of compound eye 0.27, WL 1.82 mm.

This female is even larger and more robust than the female of *O. petiolata*, but the head shape, mandibular dentition, sculpture and shape of nodes all correspond so well to what these parts of a female accompanying the *O. inca* syntypes should be like that the association seems to us quite firm despite the different proveniences of the two castes.

Alitrunk very high and swollen, strongly convex in profile; pronotum mostly vertical anteriorly; bulbous scutellum overhanging metanotum and propodeum, the latter with an almost vertical dorsal face. Petiole and postpetiole compressed anteroposteriorly as compared to worker, the postpetiole forming a mere convex cap fitted to the anterior end of the voluminous gaster.

Rugulation a little more distinct than in worker, transverse on pronotum, longitudinal on scutal disc, irregular-transverse on scutellum and petiolar node, reticulate on postpetiole. Gaster very finely and contiguously punctulate and opaque on anterior

half of first tergite, subcontiguously punctulate and feebly shining on posterior half.

Pilosity finer and more abundant than in the workers; alitrunk and gaster with abundant tapered and truncate erect hairs (unfortunately most of these were lost when the specimen was soaked in solvent to remove the crust of old glue it carried). Color ferruginous, the gaster very bright ferruginous yellow; ocellar triangle blackened and mesonotum somewhat infuscate, especially behind.

Described from an old specimen from the Wheeler Collection miscellany [MCZ] labelled simply "Bolivien", apparently from Staudinger and Bang-Haas lots; the pin bears a small green square of paper. When first found, this specimen lacked the funiculi of both antennae, and had only the damaged right forewing remaining among the wings. The forewing was figured by Brown and Nutting, 1950: (pl. 9, fig. 16; see footnote 2 on p. 122); probably the vein labeled as *r-m* is really a section of *Rs*.

This species is known to us only from the vague localities "Peru" and "Bolivia", but it is so distinctive that we do not hesitate to describe it here. Its large eyes in the worker, large size of both worker and female castes, and its slender scapes all suggest that it leads a more epigaeic foraging existence than is usual for species of this genus.

### *Octostruma jheringi* (Emery)

(Fig. 17)

- Rhopalothrix jheringi* Emery, 1887, Bull. Soc. Ent. Ital., 19: 361, alate female. Type locality: Rio Grande do Sul State, Brazil. Type in MCSNG, reviewed and compared with female digm by E. O. Wilson in 1955 (ms. notes).  
*Rhopalothrix simoni* Emery, 1890, Ann. Soc. Ent. France (6) 10: 67, worker. Type locality: Caracas, Venezuela. Holotype in MCSNG, examined. NEW SYNONYMY.  
*Rhopalothrix jheringi* Emery, 1894, in Jhering, Berlin. Ent. Zeitschr., 39: 385, fig. of holotype female head.  
*Rhopalothrix godmani* Forel, 1899, Biol. Centr.-Amer., Hym. 3: 41, pl. 3, fig. 4, alate female. Type locality: David, Chiriqui Province, Panama; holotype in BMNH, examined. NEW SYNONYMY.  
*Rhopalothrix simoni* var. *wigthi* Wheeler, 1908, Bull. Amer. Mus. Nat. Hist., 24: 161, worker. Type locality: Road to Shotover, 2 miles w. Port Antonio, Jamaica, 500 feet altitude; types in AMNH, MCZ, WWK, several examined. NEW SYNONYMY.  
*Rhopalothrix (Octostruma) simoni* race *spei* Forel, 1912: 196, worker. Type locality: Hacienda de la Esperanza foot of Sierra Nevada de Santa Marta, Colombia; type in MHNG, not seen. NEW SYNONYMY.  
*Rhopalothrix (Octostruma) simoni spei* var. *sulcata* Santschi, 1936, Revista Ent., Rio de Janeiro, 6: 201, worker. Type locality: Pueblo Viejo, Panama; holotype in NMB, not seen. NEW SYNONYMY.

Worker: TL 2.4-3.3, HL 0.59-0.74, HW 0.59-0.81 (CI 100-111), WL 0.65-0.87 mm; based on 21 specimens representing 12 separate nest series and 8 different localities in all parts of the range.

Form of head and mandibles as in Fig. 17 (though most workers have wider heads than this small specimen, which is the holotype of the synonymous *simoni*). Note the minute eyes and the translucent lateral occipital flanges (marked off by dashed lines in the figure). Vertex usually with a weak median sulcus or impression. Mandibles with 8 acutely triangular teeth, of which the basal 5 are large and subequal, the 2 subapical ones are small, and the apical tooth fairly large and acute.

Promesonotum convex in profile, with a broad median longitudinal sulcus extending nearly or quite its full length. Metanotal groove present, variable in distinctness; propodeal dorsum sloping caudad; seen from the side, its profile is convex above, then concave below before its raised borders continue onto the large, broad, acutely triangular propodeal teeth. Surface of propodeal dorsum concave from side to side between its raised borders, meeting the declivity at a fine, curving, transverse carina. Propodeal spiracles prominent, situated immediately below the teeth in the place occupied by an infradental lamella in some other species.

Petiole with a slender peduncle and a large subcubic node, slightly broader than long, with anterior border varying from deeply indented to slightly convex; peduncle with a stout oblique anteroventral process or tooth. Postpetiole rather small and depressed, not much wider than petiole and scarcely half as wide as gaster, its anterior margin nearly or quite straight and with a translucent cultrate border; posterior margin convex, though sometimes with a slight posterodorsal emargination above in the middle. Gaster broad, with anterior border semicircularly excised to receive postpetiole.

Sculpture varying rather widely from series to series (see under "Variation and synonymy" below). Head usually with rather coarse, predominantly longitudinal rugulation (Fig. 17), between which there are often visible coarse but rather shallow and indistinct punctures or foveolae. Clypeus more finely rugulose-punctulate, with coarse punctures superimposed. Alitrunk prevailingly rugose-punctate over dorsum (median sulcus and propodeal dorsum more finely sculptured, sometimes subopaque); pronotum usually more or less transversely rugose; sides of pronotum in large part densely punctate, sides behind this shagreened and either opaque or feebly shining. Petiole rugulose-punctulate or merely densely punctulate, opaque; postpetiole densely punctulate, opaque to feebly shining; gaster densely and

finely punctate, more closely so in front (and here therefore more opaque) and more sparsely behind (here more definitely shining). Mandibles, antennae and legs densely and finely granulose-punctulate, opaque. Antennal scrobes nearly smooth, shining.

Pilosity also very variable (see below). Ground pilosity of head usually consisting of numerous fine, short reclinate hairs, directed transversely mesad (obliquely mesad on clypeus). Fine short appressed hairs on gaster inconspicuous, usually mostly confined to sides and apical portion. Narrowly spatulate to simple subappressed hairs on legs, scapes, mandibles and gula. Dorsum of head usually with 8 large erect spatulate or clavate hairs; the usual arrangement is like that of Fig. 17, except that the figure lacks the hairs usually found in most specimens on each lateral occipital flange, just within the border. In most parts of the species' range, the worker lacks erect hairs on alitrunk, post-petiole and first gastric tergite, but there is usually a large pair of inclined clavate hairs on the rear of the petiolar node, and some erect hairs, mostly clavate, on the underside of the gaster and around its apex. One or two large spatulate hairs on each tibial apex. Most samples also with a peculiar set of long, fine standing hairs, apparently sensory in function: two hairs each on the posterior coxae, directed posteromesad; one hair on each side of the petiolar peduncle, arising near the spiracle and directed ventrolaterad; one hair on each anteroventral angle of the post-petiole, directed ventrolaterad; 1-3 pairs on lower surface of first gastric segment, directed ventrolaterad. Frequently one or more pairs are missing or obscured by mount adhesive; the petiolar pair is most constantly visible in our material, though even these may be missing in Panama and Colombia material (see below).

**Female:** TL 3.6-4.0, HL up to 0.79 or 0.80, HW 0.81-0.90 (CI up to 114), WL 0.99-1.08 mm; based on partial measurements on two females (south Brazil and Colombia) and full measurements on one example from Panama. Forewing L of Panama specimen ca. 3.3 mm. Judging from the worker size range, we should expect the largest females to exceed the female range given here.

Sculpture coarse but also more shining than in worker. Disc of mesonotum longitudinally rugose; scutellum bluntly projecting, its disc concave (broadly sulcate) in the middle, rugulose; both nodes rugulose. Gaster densely and regularly punctulate, interspaces narrow but shining. Pronotum with a pair of erect spatulate hairs; mesonotum with scattered spatulate or truncate erect hairs,

mostly near margins; gaster with a few scattered, narrowly spatulate erect hairs. Venation of forewing much as in *Creightoidris* (see Fig. 8), except that the apical portion of *M* is represented only by a short stump or a node projecting from *Rs+M*; the apical abscissae of *Rs* and *Cu* are also foreshortened, and *Rs* does not approach the wing margin. Otherwise differing from the worker by the usual caste differences. Male unknown.

**Material examined.** — Guatemala: Quirigua (W. M. Wheeler leg.), 4 workers [MCZ]. Panama: David, Chiriqui Prov. (Champion leg.), *godmani* female holotype [BMNH]. Panama Canal Zone: Barro Colorado Island (J. Zetek leg., N. Banks leg.), 11 workers and 1 alate female representing at least 5 separate collections [USNM, WWK, MCZ]. Colombia: Bogotá (L. M. Murillo leg.), 4 workers, 1 alate female [USNM, MCZ]. Venezuela: Caracas (E. Simon leg.), holotype worker of *simoni*. Trinidad: Northern Range (N. A. Weber leg.), 3 workers bearing the number "180". Jamaica: 2 mi. w. Port Antonio (A. Wight leg.), 12 workers syntypes of var. *wighti* [AMNH, MCZ, CTB, WWK]; Hermitage Dam, St. Andrew Parish, ca. 1750 feet altitude (H. B. Mills leg., No. J-17), 4 workers in the collections of the Illinois Natural History Survey and MCZ. Brazil: Rio de Janeiro (T. Borgmeier leg.), 2 females [CTB]; Floresta da Tijuca (C. A. Campos Seabra leg.), 11 workers [WWK]. Agudos, São Paulo State (C. Gilbert leg., W. W. Kempf leg.), 6 separate collections of workers from leaf litter [WWK, MCZ]. Bolivia: Tumupasa (W. M. Mann leg.), 1 worker [USNM].

**Variation.** — In addition to the variation already discussed above, there are some more variant specimens in a series of four workers from Bogotá, Colombia, accompanied by a winged female [loaned by USNM]. The workers are at the large end of the size range for *O. jheringi*, and are particularly robust, with upper body surfaces perhaps more convex than usual for the species. The mandibles are broad and convex, with largely smooth and shining surfaces, and at least two of the specimens have an extra small tooth intercalated between two of the large ones. The rugulosity of the sculpture is much subdued, the rugulae being confined to the anterior part of the head for the most part, and replaced on the rest of the head and elsewhere by dense, opaque reticulate-punctulate sculpture. On pronotum, traces of transverse rugulae can be seen on certain examples, but not in others.

Median longitudinal sulcus much less distinct than in other series of *jheringi*, narrow and confined to mesonotum, and even here rather feeble in two of the specimens. The pilosity is very much better developed than that seen in other series of the species: ground pilosity conspicuous, the individual hairs larger and with broadened apices, arching above surface or even curved and more or less erect, abundant on head, promesonotum, both nodes and gastric dorsum. In the workers, the fine, long paired hairs of most *jheringi* specimens are lacking on posterior coxae, petiolar peduncle, postpetiole and gastric venter. Additional erect clavate hairs, however, are found on the head: 4 in a transverse row running between the two hairs on the lateral occipital flanges; sometimes even a second small pair developed medially in front of these. Humeral and two mesonotal clavate erect pairs on alitrunk; a single pair on petiolar node, but 4 are present along the posterior part of postpetiole;

about 16 (when complement is undamaged) on first gastric segment above.

The Bogotá workers differ strikingly enough from "normal" *O. jheringi* workers that we would have described them as a new species had it not been for two circumstances. First, the female accompanying the workers (which are partly on the same pin) is winged, and therefore almost certainly is properly associated, but this female agrees in almost every detail with more "typical" females of *jheringi*. She does have considerably more erect hairs on the gaster (about 30 on first tergite), also more on mesonotum, as well as an extra pair on the mid-vertex, just in front of the ocelli. Each hind coxa bears a single fine long hair, and the pairs on the petiolar peduncle and (one pair) on the anterior underside of the gaster.

The second circumstance weighing against the description at this time of a new species for the Colombian series is the presence among Panama Canal Zone series of workers that are transitional in pilosity characters, but which have sculpture like that of other *jheringi*; size is average or below average for the species. The Panamanian samples frequently have an extra median pair of erect clavate hairs on the head and 1 or 2 pairs on the alitrunk, a pair each on the nodes, and up to 6 hairs on the first gastric tergite; ground pilosity is often rather well-developed also, but never to anything like the extent characterizing the Bogotá series workers. In order to decide whether the Colombian series represents a separate species, or merely a strong geographical trend within *O. jheringi*, we need more material from Colombia and the adjacent part of Panama.

A pathological specimen from Barro Colorado Island has petiole, postpetiole and gaster fully ankylosed, without a trace of dorsal sutures, but with the separation well-marked laterally.

**Synonymy.** — The synonymy of this species is relatively straightforward, being marked by the usual myrmecological casualness about intraspecific variation and proper comparison with previously-named related forms. When Emery described *simoni*, he had a single nanitic worker, and did not recognize its conspecificity with his *jheringi* type from far away in southern Brazil. Forel had less excuse for describing *godmani*; the type compares well with a digm later compared with the *jheringi* type. In proposing their three intraspecific variants, Wheeler, Forel and Santschi did not consider the female representatives of the 8-segmented (*Octostruma*) forms at all, but were content with emphasizing trifling variations away from "typical" *simoni*, which was based, as already mentioned, on a single nanitic worker. We have checked the syntypes of var. *wighti*, and can find no reason to sustain this name. Though we have reviewed no types of *spei* or *sulcata*, the descriptions of these forms, as well as their type localities, make it seem reasonably certain that they are straight synonyms of *O. jheringi* as we understand that species here.

### ***Octostruma wheeleri* Mann**

*Rhopalothrix (Octostruma) wheeleri* Mann, 1922: 43, worker. Type loc.: Livingstone, Guatemala. Holotype in USNM.

The worker holotype was examined and measured with the permission of Dr. M. R. Smith. TL 3.0, HL 0.64, HW 0.71 (CI 111), WL 0.78 mm.

Habitus of head much as in *O. jheringi*; sculpture, though irregularly rugulose-punctate, less rugged than in *jheringi*, and not forming longitudinal costulae. Posterior occipital surface and most of alitrunk smooth but very finely shagreened and opaque to subopaque. Gaster densely punctate. Alitrunk convex in profile, without longitudinal sulcus; propodeal dorsum sloping posteriad; propodeal teeth triangular. Six erect clavate hairs on cephalic dorsum: one pair far up on the verticociput, one hair on each side of the occipital lobes posteriorly and one hair on each side near the eyes. No other prominent erect hairs on body. Numerous fine, short appressed hairs on head, dorsum of alitrunk, both nodes and gaster. Color reddish-brown.

A single badly rubbed specimen labeled "Tres Rios, C. Rica", collected by A. Bierig and in the Borgmeier Collection [CTB], is similar to the *wheeleri* holotype and is probably the same species, though it has not been compared directly with the type. TL 3.2, HL 0.72, HW 0.78 (CI 108), WL 0.80 mm. This worker has a very feebly marked metanotal groove.

#### Group of *balzani*

The species *balzani*, *batesi*, *rugifera*, *rugiferoides* and *stenognatha* are closely interrelated small forms with rather similar habitus. The head and mandibles are basically of one type, with reduced or obsolete lateral angles or lobes on the occipital lobes; occiput convex, but the dorsum of the head in front of this flat or concave; junction of concave and convex surfaces more or less distinct, marked in two species (*rugifera* and *rugiferoides*) by a distinct arcuate carina running from the vicinity of one compound eye across to the other. The variations in head form are shown in Figs. 15-22. Alitrunk high and compact, as in Fig. 30, or more convex above; metanotal groove may be moderately distinct, as in the figure, or may be obsolete; propodeal dorsum sloping steeply and mostly concave, continued as the acutely triangular propodeal teeth, the teeth extended ventrad as a narrow concave lamella on each side of the declivity. Petiole pedunculate, with node obliquely anteroposteriorly compressed, rather high and narrow as seen from the side, with truncate (Fig. 30) or narrowly rounded summit in this view; as seen from above, the node rectangular, transverse, its anterior border straight or feebly concave.



Interspecific differences occur in size, shape and dentition of the mandibles, in development of the lateral occipital lamellae, in strength of the lobe of the base of the scapes, in sculpture and in hair pattern. The ground pilosity is mostly suppressed, largely absent or fine, appressed and inconspicuous in these species, except on the legs and occasionally the gaster. The stubby erect clavate hairs are arranged in 2 or 3 transverse arcs or rows of 2-6 hairs each, as is usual for the genus, but samples with a full complement are relatively uncommon, due both to fixed reductions in pattern (e. g., *rugiferoides* and some samples of *balzani*) and to loss of hairs by abrasion from specimens that probably originally had them all. The scapes have the usual fringe of spatulate hairs, but the upper surfaces of the scapes are nearly or quite naked. The alitrunk may have up to 3 pairs of erect clavate hairs, as in Fig. 30, but this is exceptional; most samples have 1 or 2 pairs, or none at all. Petiolar node with posterior pair of clavate hairs (or none); postpetiole with 1 or 2 pairs posteriorly, and more rarely a small pair anteriorly. Clavate hairs on the gastric dorsum up to 24 or 28 on the first tergite, arranged more or less in rows of 4; smaller clavate hairs at the gastric apex.

Basic sculpture is a uniform dense punctulation throughout, the surface generally opaque or subopaque, depending on whether the bottoms of the punctulae or the narrow interspaces are smooth or shagreened. *O. rugiferoides* (q. v.) departs from this pattern somewhat in having the basic sculpture modified to rugulose or smooth over some surfaces. The color of fully adult workers and females is medium ferruginous (reddish-brown); occasional samples are darker and more brownish.

This group, confined to tropical parts of the Americas, is a most interesting one from the distributional point of view. *O. balzani* is far and away the most common and widely distributed basicerotine in the New World; it is also very variable over most of its range, which reaches from southern Mexico and the Lesser Antilles south to the Plata Basin and the Bolivian Andes. In southeastern Brazil, *balzani* is intimately sympatric with a local species, *O. stenognatha*, and there appears to be mild character displacement between these two in the area of sympatry. Also occurring in this same area of southeastern Brazil is the species *rugifera*, with the well-developed arcuate cephalic carina. This carina has a "shadow homologue" in some samples of *balzani*, particularly in some of those from northern South

America and Central America. The carina turns up again in very distinct form in the apparently rare sibling *rugiferoides*, from southern Mexico, just within the northern limit of range of *balzani*. For *batesi*, we have only a single record from the poorly collected Amazonian area, and no other specimens are known.

The combined distributions of these species (setting *batesi* to one side) suggest a centrifugal pattern of evolution, with *balzani* as the current "growing point" of the group: the generally-adapted species that is crowding the previous species-waves into peripheral parts of the total range of the group. Probably their specializations in structure match ecological specializations that allow them to coexist at least peripherally for the time being with *balzani*; however, at the present time we have no information about the food- or nesting-habits of any of these species. It is interesting to compare the *balzani*-group distribution with that of the *Eurhopalothrix procera* group (below, and Fig. 56).

### ***Octostruma balzani* (Emery)**

(Figs. 18, 22, 24, 26, 27, 30)

*Rhopalothrix Balzani* Emery, 1894: 217, pl. 1, fig. 10, worker, female. Type localities: Districts of Coroico and Chulimani-Yungas, Bolivia; other locality, Salinas sul Beni, Bolivia. Types in MCSNG; worker from Coroico examined and here designated as lectotype.

*Rhopalothrix (Octostruma) lutzii* Wheeler, 1913, Bull. Amer. Mus. Nat. Hist., 32: 241, worker, female (part.). Type localities: Laudet and Long Ditton, near Roseau, Dominica, B.W.I. Lectotype, by present designation, the specimen (Long Ditton) so labelled in MCZ, examined. NEW SYNONYMY.

*Rhopalothrix (Octostruma) barberi* Mann, 1922: 42, worker. Type locality: Trece Aguas, Alta Vera Paz, Guatemala. Holotype in USNM, examined. NEW SYNONYMY.

*Rhopalothrix (Octostruma) equilatera* Weber, 1934: 52, fig. 10, worker. Type locality: Tuli Creek, near San Miguel, Nicaragua. Syntypes in MCZ and NAW, examined. NEW SYNONYMY.

Worker: TL 1.9-2.7, HL 0.48-0.58, HW 0.51-0.65 (CI 101-113), WL 0.50-0.65 mm; measurements based on 42 workers representing at least 18 separate nests from all parts of the range, including the holotype worker: HL 0.56, WL 0.60 mm, CI 102; head narrower than average for this species.

Ergatoid females (gynecoid workers) are like the worker, but are larger and have ocelli. The alitrunk is proportionately a little longer, and sometimes the promesonotal suture is better-developed; erect hairs are more numerous and widely distributed. Female: TL 2.7-3.0, HL 0.58-0.63, HW 0.62-0.65 (CI 100-109), WL 0.75-0.80 mm (8 specimens from 5 localities).

The general form of the head (Figs. 18, 22, 27) and alitrunk and petiole (Fig. 30) varies within limits individually and among different nest series. Occiput convex and anterior part of cephalic

dorsum flat or shallowly concave; the meeting of these two surfaces often produces a feebly indicated, blunt ridge or rise crossing the head in an arc and corresponding to the carina found in *rugifera* and *rugiferoides*. Lateral occipital (postocular) angles obtuse to obsolete.

Mandibles of moderate length, their upper surfaces feebly convex, external margins weakly convex in outline; masticatory border and teeth very slightly depressed; usually 7 larger teeth, with 2-3 minute intercalary denticles. Basal tooth most commonly broad and bluntly rounded or subtruncate, filling or nearly filling the space between mandibles and clypeus at full closure (Figs. 26, 27). In occasional specimens from the northern part of the range (thus away from the range of the sibling *O. stenognatha*), the basal tooth is variably narrowed to a blunt point (Fig. 24), but never to the extent of *stenognatha*. The compound eyes vary in size from small to very small, apparently allometrically corresponding to degree of gynecoidy.

Alitrunk more or less as shown in Fig. 30, but often more convex above in outline; metanotal groove varying from reasonably distinct, as in Fig. 30, or more feeble, to virtually obsolete on the dorsum. Propodeal teeth also somewhat variable in size and shape. Petiolar node as in Fig. 30, varying to a much more rounded summit profile; as seen from above, node proper about twice as long as broad in most samples, rectangular. Postpetiole subreniform, broader than petiole (but not twice as wide) and about half or a little more as wide as the first gastric segment.

The stubby erect clavate hairs vary considerably in number present; the pattern shown in Fig. 18 is a common one, allowing for hairs broken off. Additional pairs of hairs added on head, alitrunk, postpetiole and gastric dorsum commonly accompany increase in size, and apparently represent a gynecoidal tendency (Fig. 22). The alitrunk may have no erect hairs, but often 1, 2, or even as many as 3 pairs are present (Fig. 30). On the dorsum of the first gastric segment, the number of hairs is usually between 6 and 12, but may reach as high as 20 or more, mostly concentrated on the posterior 2/3 of the segment in rows of 4 or 6. Ground hairs are generally appressed or reclinate and inconspicuous, but in some samples they are easily seen, though appressed, on clypeus, anterior part of head or gastric dorsum, or all three places. Sculpture densely and regularly punctulate, prevailing opaque. Color varying shades of reddish-brown.

Male unknown.

**Synonymy.** — *Rhopalothrix lutzii* was based on a mixed type series from Dominica containing specimens that agree well with the *O. balzani* types, and others fitting the concept of *Eurhopalothrix gravis* (q. v.) in this revision. It is evident from Wheeler's description that the name *lutzii* is based primarily upon the smaller workers with 8-segmented antennae, i. e., on the *O. balzani*, rather than the *E. gravis* component of the series. Types of *barberi* and *equilatera* were examined, and these fall well within the limits of variation established here for *balzani*.

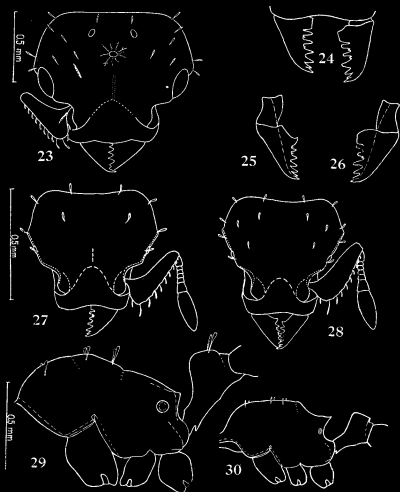
**Material examined.** — Mexico: Veracruz: Pueblo Nuevo, near Tetzonapa, leaf litter berlesate from rather dry, rocky, tropical evergreen forest (E. O. Wilson leg.); Peñuela, alt. ca. 700 m. (H. S. Dybas leg.). Puebla: Llano Grande (F. Bonet leg.). Tabasco: Villa Hermosa (Bonet leg.). Chiapas: Tuxtla Gutierrez, origin of lot taken in *Begonia* tubers in U. S. Plant Quarantine at Laredo, Texas); Ocosingo (C. & M. Goodnight & L. J. Stannard leg.); Palenque Ruins (Goodnights leg.). Guatemala: Trece Aguas, cacao (Schwarz & Barber leg.), holotype of *barberi*. Nicaragua: Tuli Creek, near San Miguel, stomach of frog *Dendrobates tinctorius* taken on forest floor (G. K. Noble leg.), types of *equilatera*. Costa Rica: Hamburg Farm, Limon (F. Nevermann leg.); Santa Ana and Turrucares (A. Bierig leg.). Panama Canal Zone: Barro Colorado Island (N. A. Weber leg., J. Zetek leg.), several collections. Colombia: Restrepo, Dept. Meta, alt. ca. 500 m, nest in dead snail shell (J. C. Bequaert leg.). British Guiana: Forest Settlement, R. Mazaruni, several collections (Weber leg.). Trinidad: Guayaguayare Bay and Maracas Valley (Weber leg.). Dominica, British West Indies: Laudet and Long Ditton, near Roseau, sifted from leaves at forest edge (F. Lutz leg.), types of *lutzii*. Brazil: Pará: Belém, rain forest soil (C. W. Beebe). Mato Grosso: Rio Caraguata, alt. 400 m (F. Plaumann leg.). São Paulo: Agudos (W. W. Kempf leg.). Paraná: Rondon (Plaumann leg.). Bolivia: Coroico type locality by present selection of lectotype (Balzan leg., lectotype worker of *balzani*).

**Summary of distribution.** — Tropical Mexico south through C. and S. America at low and moderate elevations to the Bolivian Andes and (at least) to Paraná and São Paulo states in the southeast; on Trinidad, Dominica and probably other islands of the Lesser Antilles. Forest or tree-plantation areas; nests in soil or leaf litter, sometimes in small natural cavities in objects in the litter; apparently forages in the litter. The careful leaf litter collecting by Plaumann and others in extreme southeastern Brazil, especially in Santa Catarina, indicates that *balzani* tends to be replaced by the sibling *O. stenognatha* toward the south of this area, where *O. rugifera* also becomes more common.

### ***Octostruma stenognatha*, sp. nov.**

(Figs. 25, 28)

**Holotype worker:** TL 2.2, HL 0.52, HW 0.52 (CI 100), WL 0.56 mm. **Paratype workers:** TL 2.0-2.3, HL 0.49-0.56, HW 0.49-0.56 (CI 94-103), WL 0.52-0.60 mm, based on 33 workers from at least 14 different nest series from 4 different localities in all parts of the known range. Paratypes, ergatoid



*Octostruma* Forel. — Fig. 23. *O. petiolata* (Mayr), ♀ [lectotype]. — Fig. 24. *O. balzani* (Emery), ♂ mandibles [syntype of *syn. totali*]. — Fig. 25. *O. stenognatha*, n. sp., ♀ mandible [paratype from Agudos, S.P.]. — Fig. 26. *O. balzani* (Emery), ♀ mandible [Agudos, S.P.]. — Fig. 27. *O. balzani* (Emery), ♀ head [Agudos, S.P.]. — Fig. 28. *O. stenognatha*, n. sp., ♂ head [holotype]. — Fig. 29. *O. inca*, n. sp., ♀ thorax and petiole [paratype]. — Fig. 30. *O. balzani* (Emery), ♀ thorax and petiole [Mexico: Chiapas].

females (or gynecoid workers): TL 2.6-2.8, HL 0.58-0.60, HW 0.60-0.63 (CI 100-106), WL 0.65-0.71 mm, based on 4 examples.

The holotype, paratypes and ergatoids are very similar to the corresponding castes of *O. balzani*, but the head averages narrower and differs slightly but significantly in form (compare Fig. 28 with Fig. 27). Sides of head in the region of the eyes less strongly converging and longer; distance between anteocular and postocular angles normally exceeding distance between

postocular and occipital angles (usually the postocular angle — occipital angle distance is slightly greater in *balzani*). Dorsum of head gently convex, with a shallow median impression centered on the vertex (dorsum not divided into convex occipital and flat or concave frontal surfaces as it is in *balzani*).

Mandibles narrower than in *balzani*, with nearly or quite straight outer margins; basal tooth subtriangular, pointed, its basal border sloping sharply away to the basal margin of the mandible in such a way as to leave a gap in front of the clypeus at full closure (though the gap may be hard to see if the labrum is extended beneath it). Compare Fig. 25 with *balzani* mandibles, Figs. 24 and 26. Masticatory margin with 7 triangular teeth plus 1-3 minute intercalary denticles. Basal lobe of scape more broadly rounded (less produced) than in *balzani*.

Alitrunk and remainder of body formed much as in *balzani*, but petiolar node not so strongly compressed anteroposteriorly, its dorsum only slightly broader than long and about half as wide as postpetiole.

Ground pilosity even less well-developed than in the average *balzani* worker. Erect clavate-spatulate hairs more abundant and longer than in average *balzani* workers, but not exceeding the maximum number for that species; usually 16-18 erect hairs on cephalic dorsum (Fig. 28), of which the hair nearest the eye is placed slightly in front of the eye (more mesad of eye in *balzani*). The postpetiole carries 4 hairs along the posterior margin, of which the outer pair is placed on the posterolateral angles. Alitrunk with 1 or 2 pairs, petiolar node with a single pair.

Color and sculpture as in *balzani*, except that the interpunctural spaces on the gastric dorsum seem to be smoother and more shining than the average for *balzani*.

The ergatoids have slightly coarser sculpture and more erect hairs than the worker has; eyes much larger than in worker; ocelli small, forming an obtuse triangle; petiolar node more transverse.

Dealate female paratype: TL 2.7, HL 0.58, HW 0.58 (CI 100), WL 0.78 mm. With true pterothorax and other modifications of its caste; erect hairs more abundant than in ergatoid or worker.

Holotype a worker from Agudos, São Paulo State, Brazil (W. W. Kempf leg., No. 1334), January 23, 1955, in soil cover berlesate from very moist forest [WWK].

Paratypes [WWK, CTB, MCZ, USNM and elsewhere] from the following localities in Brazil: Rio de Janeiro State: Itatiaia (J. F. Zikan leg.). São Paulo State: Cantareira Mts., near São Paulo, February-March 1959 (W. W. Kempf and V. dos Santos leg.); Agudos, January, March, November, December 1955 (Kempf leg. at type locality and partly from same heresate as holotype). Paraná State: Rio Azul, October, 1959 (F. Plaumann leg.). Santa Catarina State: Nova Teutônia, 1954-1959 (Plaumann leg.); Seara, July-August, 1958 (Plaumann leg.); Xaxim, December, 1957 (Plaumann leg.); Passo Bormann, December, 1957 (Plaumann leg.); Chapecó, December, 1957 (Plaumann leg.); Ibicaré, July, 1959 (Plaumann leg.). Rio Grande do Sul State: Tainhas, April, 1959 (Plaumann leg.); Nova Petrópolis, November, 1959 (Plaumann leg.).

**Discussion.** — At first we thought this form was only a slender variant of the very plastic *balzani*. But since it is partly sympatric with *balzani*, and yet remains constantly distinct in the area of sympatry, it is clear that it is a separate species.

### ***Octostruma rugifera* (Mayr)**

(Fig. 21)

*Rhopalothrix rugifer* Mayr, 1887: 579, worker. Type locality: Santa Catarina State, Brazil. Syntypes in NMV, not seen.  
*Rhopalothrix rugifera*, Emery, 1894: 217, worker, in key.  
*Rhopalothrix (Octostruma) rugifera*, Emery, 1922: 329. — Santschi, 1933, An. Soc. Cient. Argent., 116: 117, Loreto, Misiones, Argentina.  
*Rhopalothrix (Octostruma) truncata* Forel, 1912: 196, female. Type locality: Rio de Janeiro, Brazil. Type in MHNG, not seen. NEW SYNONYMY.

**Worker:** TL 2.0-2.5, HL 0.52-0.63, HW 0.51-0.65 (CI 97-109), WL 0.49-0.60 mm. Based on 18 specimens from at least 10 separate collections from all parts of the known range.

**Ergatoid female:** TL 2.6, HL 0.65, HW 0.69 (CI 106), WL 0.67 mm.

**Female:** TL 2.9-3.1, HL 0.65-0.67, HW 0.67-0.69 (CI 103-105), WL 0.76-0.80 mm.

Very similar to the corresponding castes of *O. balzani*, but with a distinct arcuate carina stretched across the vertex between the compound eyes. Also the following minor characters:

1. Pilosity, especially the erect hairs, averaging finer and less abundant than in corresponding castes of *balzani*. Worker with 4-8 erect hairs on head proper, of which the hair behind each eye and the pair on mid-vertex are perhaps the most constant in presence. Alitrunk and petiole normally without erect hairs, postpetiole with a single median pair; first gastric segment with 8-12 hairs, mostly on posterior half. Female with more abundant erect hairs: 14-18 along transverse cephalic carina, and 4-6 behind this on head; about 16 on mesonotum, 1 pair each on both nodes, 30 or more on first gastric tergite.

2. Propodeal dorsum shorter than in *balzani*, more steeply sloping, ending in shorter teeth.

3. Gaster very slightly less opaquely sculptured than in *balzani*, owing to narrow but shining interpunctular spaces.

4. Basal tooth of mandible triangular, with narrow, tapering apex.

Male unknown.

Variation and synonymy. — Aside from variation in proportions, the samples vary somewhat in the degree of completeness of the erect pilosity complement; many specimens appear to be rubbed, and since the hairs are more delicate than those of *balzani*, they are probably more easily lost through abrasion. The female described by Forel, though not examined, cannot be distinguished by any character mentioned in the original description from females associated with workers evidently belonging to *O. rugifera*, and it seems clear from Forel's characterization that he had the *rugifera* female.

Material examined: 146 workers, one ergatoide female and 5 females, as follows: Brazil, Federal District: Floresta da Tijuca (C. A. Campos Seabra leg.), 4 workers. São Paulo State: Cantareira Mts. (Kempf leg.), 1 worker, 1 ergatoid. Paraná State (all F. Plaumann leg.): Caiobá, 1 worker; Rio Azul, 21 workers, 1 female. Santa Catarina State (all F. Plaumann leg.): Nova Teutônia, 62 workers, 2 females; Linha Facão, 10 workers, 1 female; Seara, 6 workers, 1 female; Passo Bormann, 3 workers; Itajubá, 2 workers; Concórdia, 3 workers; Chapecó, 9 workers; Xaxim, 1 worker. Rio Grande do Sul State (all F. Plaumann leg.): Tainhas, 15 workers; Nova Petrópolis, 8 workers. Argentina, Misiones: Loreto (Oglob'in leg.), 1 worker from same lot as mentioned by Santschi (*loc. cit.* 1933), who states that only one of his specimens had the cephalic carina well-developed, the other not. The specimen without carina could have been *balzani*, or more likely, *stenognatha*. [WWK, CTB, MCZ, USNM and elsewhere].

### ***Octostruma rugiferoides*, sp. nov.**

(Fig. 20)

Holotype worker: TL 2.0, HL 0.53, HW 0.55 (CI 104), ML 0.13, WL 0.52 mm. Closely resembles small workers of *O. rugifera*, but the blunt lateral angles behind the eye are reduced and ventrally displaced, so as not to be visible from full-face dorsal view (compare Figs. 20 and 21); mandibles also slightly shorter. The following additional differences are noted:

1. Head and promesonotum with rugulo-reticulum overlying punctulation; concave portion of head anterior to transverse arcuate carina (including clypeus) irregularly rugulose, with a fine median longitudinal carina, weakly shining, except the posterior lobe of the clypeus and the median frontal region just behind it, which are smooth and shining. Mandibles smooth and



shining. Body otherwise densely granulose-punctulate and opaque, except for the weakly shining posterior half of gaster.

2. Metanotal groove nearly or quite obsolete on the dorsum, rendering the dorsal profile in side view rather even in transition from the mesonotum into the gently sloping propodeal dorsum.

3. Petiolar node seen from side more narrowly rounded over summit.

4. Erect hairs lacking on alitrunk and both nodes; 2-3 spatulate ones at tibial apices. First gastric tergite with only a single transverse row of 4 erect clavate hairs near its posterior margin, although numerous minute, curved, reclinate ground hairs are somewhat more abundant and conspicuous over this tergite than in *O. rugifera*.

Holotype [MCZ] taken at Pueblo Nuevo, near Tetzonapa, Veracruz, Mexico, on August 13, 1953, in leaf litter of dry, rocky, tropical evergreen forest (E. O. Wilson leg., no. 224). A single paratype worker [WWK] also taken by Wilson at the type locality in rain forest leaf litter is slightly larger: TL 2.2, HL 0.55, HW 0.57 (CI 104), ML 0.13, WL 0.56 mm (August 7, 1953).

This species, known only from the type collections, is sympatric at Pueblo Nuevo with *O. balzani*, a specimen of which was even taken in the same Berlese sample with the holotype of *rugiferoides*. The new species is of course distinct from *O. balzani* in having a very distinct transverse cephalic carina, as well as in details of sculpture and pilosity. Apparently, *rugiferoides* is very close to the geographically separated *O. rugifera*, and the two are near opposite edges of the range of the probably "youngest" member of the complex, *O. balzani*, which appears to be on the point of overwhelming the ranges of both carinate species.

### ***Octostruma batesi* (Emery)**

(Fig. 19)

*Rhopalothrix batesi* Emery, 1804: 218 (and in key, p. 216), pl. 1, fig. 11, worker.  
Type locality: "Amazonas". Holotype in MCSNG, examined.

Holotype worker: TL 2.8, HL 0.64, HW 0.71 (CI 111), WL 0.78 mm.

This species is similar to *balzani*, but is a little larger and has more conspicuous, rounded lateral flanges on the occipital lobes behind the compound eyes. Also, the scapes are not so strongly lobiform at the basal angle. We know *batesi* from only the single holotype worker, so it is impossible to be sure of the status of the species. It could even be an extreme form of *balzani*. The female is needed before the relationships of this species can be properly assessed.

**Eurhopalothrix**, gen. nov.

Since the type species of *Rhopalothrix* s. str. (*R. ciliata*) has been found to be a "long-mandibulate" species, the remaining species of *Rhopalothrix*, with triangular, serially dentate mandibles and a total of seven antennal segments, are left without a generic name. With the present raising of *Eurhopalothrix*, we hereby supply that name.

**Workers and females:** Medium-sized to very small basicerotines, compact in build, with serially-dentate, triangular mandibles that close tightly against the clypeal margin and against each other; their blades are porrect or sub-porrect, with slightly downcurved apices. Labrum tongue-like, movable, bilobate at apex. Occipital lobes angularly expanded laterad, usually with one prominent angle behind the compound eye and another farther back, next to the posterior median excision. Compound eyes of worker varying in size, small to medium-sized.

Alitrunk compact, metanotal groove distinct or absent; propodeal teeth acute or triangular and lamelliform, rarely absent. Petiole pedunculate in most species (not in *bruchii*); postpetiole broad, reniform or elliptical and usually fitting into a shallow semicircular emargination of the gaster.

Sculpture varying from rugose-punctate to granulose, the gaster usually densely punctulate or cribrately punctate. Pilosity bizarre, usually with more or less extensive squamiform ground pilosity; many species with a few erect to decumbent hairs thickened, cochlear, clavate or spatulate and arranged in a symmetrical pattern on head, and often also on alitrunk, nodes and gaster, but in other species, the complement of erect hairs is nearly or quite absent, undoubtedly marking a secondary evolutionary loss. Tibiae usually with one or more thick clavate or spatulate hairs at apex. Color ranging from ferruginous yellow to blackish-brown.

**Male:** See under tribal diagnosis.

*Eurhopalothrix* as at present constituted includes 17 species, or nearly half of all the species in the tribe. Of the 17, 8 species (in two groups) are confined to the New World, while 9 (in three groups) are found only in the Indo-Australian-southwestern Pacific area. The species are all tropical or subtropical, and most or all are thought to be cryptic foragers in forests. *E. biroi* is known to be predaceous on small, soft-bodied arthropods, especially Collembola.

Group of *bolau*

This group includes *alopeciosa*, *bolau*, *clypeata*, *floridana*, *gravis*, *pilulifera* and *speciosa* — seven of the eight known New World species of the genus, and leaving out only the aberrant *E. bruchi*. They are rather typical members of *Eurhopalothrix*, small to very small in size, and most of them (5 of the 7 species) have a typical complement of the larger specialized hairs, these varying with the species from slender clavate or spatulate to subspherical ("pompon-like"). The typical or "full" (and probably generalized) arrangement is as follows: 8 hairs forming a double arc from eye to eye across vertex; behind this a straight transverse line or row of 4; along the posterior occipital margin a row of 6 (Figs. 35, 36, 38). On the alitrunk, one pair on the humeri and two pairs straddling the mesonotum, the posterior pair much closer together and near the metanotal groove. Petiole with one posterior pair; postpetiole with 4 hairs along the posterior margin, of which the two hairs in the middle are often smaller. Gastric dorsum with a longitudinal row of 4-5 hairs on each side of the midline of the first large segment; there is sometimes present an additional row on each side of the two median rows (Figs. 31, 32). Apical segments fringed with short clavate hairs. In *E. speciosa*, and especially in *E. floridana*, the large hairs are reduced in number, on the head as well as on either the alitrunk (*speciosa*, Figs. 31-33) or gaster (*floridana*, Fig. 38 and description, below).

This group is native to and widespread in the New World tropics, with one species reaching Florida and another occurring, possibly as a tramp, in the Lesser Antilles. Southward, at least two species reach into southeastern Brazil. In those cases where several nest series are available, particularly in *gravis*, the species show considerable internidal and geographical variation, particularly in size, color, head shape and in the form and size of the individual hairs. The larger species (*gravis*, *bolau*) tend to have deeper metanotal grooves than do such smaller species as *speciosa*, *alopeciosa* and *clypeata*. The smaller species generally also have smaller compound eyes in the worker caste.

***Eurhopalothrix speciosa*, sp. nov.**

(Figs. 31, 32, 33)

Holotype worker: TL 2.8, HL 0.76, HW 0.78 (CI 103), scape L 0.49, maximum diameter of compound eye 0.09, WL 0.72 mm. Form of head and body as shown in the figures.

This is a medium-sized member of the *bolaii* group notable for the reduction of its pilosity. The appressed and subappressed ground pilosity consists of small to minute, mostly simple hairs, rather dense on mandibles and clypeus, sparse on dorsum of nodes and gaster, and very sparse and inconspicuous on vertex, occiput and alitruncal dorsum. Simple appressed small hairs of the legs give way on the tibiae, especially the flexor surfaces, to appressed and decumbent spatulate hairs. Extensor apical point of each tibia with the short, thick clavate hair usual for the genus. The larger specialized hairs are thick-squamiform, reduced in number (compare Figs. 35 and 39) on the head, and are set in marginate foveae that tend to be more distinct than in related species. The close rectangular group on the median field of the occiput is especially characteristic. Humeral pair absent on holotype and both paratypes, indicating that they are probably truly lacking and not just rubbed off. The two pairs of mesonotal hairs are exceptionally large and thick, and the posterior pair is set in contiguous foveae separated by a short longitudinal carina. Other hairs of the large type arranged as usual in this group of species; median postpetiolar pair small.

Promesonotal suture virtually obsolete; metanotal groove present but indistinct. Body densely punctulate-granulose, opaque; dorsum of head finely rugulose in addition. Clypeus and gaster finely and densely punctulate, subopaque (narrow interspaces mostly individually shining). Mandibles almost smooth, moderately shining, with about 8 or 9 teeth (not dissected). Color medium ferruginous; legs and pleura more yellowish.

Holotype [WWK No. 2648] a worker from Nova Teutônia, Santa Catarina State, Brazil; sifted from leaf mold by F. Plaumann during May, 1957. Paratypes: two workers, one with the same data as the type [MCZ], and the other from Serra Geral, Santa Catarina, also collected by Plaumann from leaf mold, December, 1958 [WWK No. 3004]. This last paratype is larger than the holotype: TL 3.3, HL 0.87, HW 0.89 (CI 102), scape L 0.54, maximum diameter of eye 0.12, WL 0.85 mm. Front of head more irregularly rugulose, the sculpture less longitudinally oriented; dorsum of alitrunk more rugulose. Large hairs on occiput and mesonotum less strongly inflated. Otherwise similar to holotype.

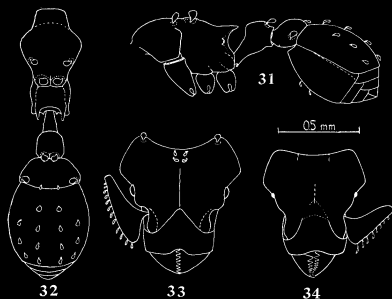
This species, so far known only from southeastern Brazil, is readily separated from all other members of its genus by the peculiar shape and arrangement of the larger specialized hairs.

*Eurhopalothrix clypeata*, sp. nov.

(Fig. 37)

Holotype worker: TL 2.0, HL 0.52, HW 0.50 (CI 96), scape L 0.32, maximum eye diameter about 0.025, WL 0.52 mm.

This species is a rather typical small member of the *bolau* group, distinguished above all by its peculiar clypeus, which is



*Eurhopalothrix*, New World Species: Fig. 31, *E. speciosa*, n. sp., ♀ thorax and gaster in profile [holotype]. — Fig. 32, *Idem*, ♀ thorax and gaster in dorsal view [holotype]. — Fig. 33, *Idem*, ♀ head [holotype]. — Fig. 34, *E. floridana*, n. sp., ♀ head [holotype].

divided by an arcuate transverse carina into a large, sloping, concave anterior part and a small, weakly convex, triangular posterior part (Fig. 37). As in *gravis*, *alopeciosa* and the Old World *australis* (Fig. 46), *clypeata* is "bald", i. e., the part of the verticociput occupied by the specialized (in this case very strongly clavate and erect) hairs either lacks the small appressed-squamiform ground pilosity entirely, or else has it very noticeably more sparsely represented than on the frontal section of the head and on the more lateral sections of the occipital lobes. The "bald spot" coincides more or less exactly with the field occupied by the larger specialized hairs, and is frequently more or less accentuated by the presence of whitish foreign material on other parts of the dorsum of the head.

In the *clypeata* holotype, the ground pilosity is much sparser and more restricted in distribution than it is in *alopeciosa*, *gravis*, *australis* or *pilulifera*. It is absent or extremely reduced, not only in the vicinity of the larger hairs, but also in the middle of the frontal section, on the middle of the clypeus, and on the alitrunk, petiole and gaster. Only on the head, postpetiole, scapes and legs is the ground pilosity reasonably distinct. The virtual absence of the small ground hairs from the gaster is especially striking; this can scarcely be due to abrasion, because all 16 of the larger, erect, thick clavate hairs are present on the first gastric tergite (4 rows of 4 hairs each). Large hairs present in full complement (3 pairs on alitrunk, with one hair missing through abrasion); they all are very thick-clavate, erect, but not quite so extremely inflated and "pompon-like" as in *pilulifera* or *alopeciosa*.

The alitrunk is similar to that of *speciosa* (Fig. 31), but in *clypeata* it is a little shorter and higher and more strongly convex above in profile; the mesonotum is rather prominent, but is not longitudinally carinate; metanotal groove present but shallow. Petiolar node more compressed anteroposteriorly than in *speciosa*, its anterior face steeply sloping and meeting the summit through a narrowly rounded curve, behind which the convex posterodorsal face slopes away to the rear. Seen from above, the node is very slightly broader than long, with a nearly straight (very feebly concave) anterior margin.

Body punctulate-granulose, opaque, the punctures more distinct on gaster. Center of clypeus smooth and shining; mandibles feebly sculptured and weakly shining. Color medium ferruginous, gaster slightly infuscated except at its base.

Holotype a unique [NAW] taken by N. A. Weber between the River Cuyuni and the River Mazaruni, British Guiana, presumably in forest, on September 7, 1935. This is still the only known specimen.

#### ***Eurhopalothrix alopeciosa*, sp. nov.**

Holotype worker: TL 2.0, HL 0.52, HW 0.50 (CI 96), scape L 0.32, greatest eye diameter about 0.02, WL 0.50 mm.

Combines characters of *clypeata* and *pilulifera*. Head shape as in *clypeata* (Fig. 37), but the clypeus of the usual form, not transversely carinate (very feebly convex, with shallowly depressed

anterior margin). Pilosity of head arranged as in *clypeata* (Fig. 37), except that a few small appressed hairs of the ground pilosity are scattered over the "bald space" occupied otherwise by the large specialized hairs. Clypeus set evenly with small squamiform hairs throughout, as are also the mandibles, dorsal scape surfaces, anterior half of head above and sides of occiput, and promesonotum, petiolar node, postpetiole and gastric dorsum. The ground pilosity is similar to that of *pilulifera*, but the individual ground hairs are more orbicular, larger and more abundant. The large specialized hairs are prevalingly subspherical or "pompon-like", relatively broader than those of *clypeata* and perhaps even of *pilulifera*, especially on gastric dorsum, where they form an irregular double row (4-5 pairs) down the middle of the first tergite, the double row flanked on each side by 2 or 3 additional hairs representing vestigial longitudinal rows. The usual clavate or truncate hairs are present on the gastric apex, and the hair on each tibial apex is pompon-like.

Body form otherwise and color much as in *clypeata*.

Holotype a worker [NAW] from Trinidad, British West Indies (N. A. Weber leg., No. 162.2). A paratype worker [MCZ] from Maracas Valley, Trinidad, March 23, 1935 (Weber leg., No. 76), is similar to the holotype, but is somewhat damaged; it is a little larger than the holotype and has a relatively broader head: HW about 0.53 (CI about 101); WL 0.52 mm.

### ***Eurhopalothrix floridana*, sp. nov.**

(Fig. 34)

Holotype worker: TL 2.8, HL 0.65, HW 0.62 (CI 95), scape L 0.40, greatest eye diameter 0.04, WL 0.66. Similar to *E. speciosa*, but differing in the narrower head, smaller eyes, longer mandibles, more rounded clypeal corners, slightly less strongly lobate scapes, and in pilosity. The ground pilosity is more abundant and more conspicuous, rather densely and evenly arranged over the dorsum of the head, and consisting of small whitish appressed spatulate hairs. The specialized large hairs, on the other hand, are even more reduced than in *speciosa*, being restricted to a single pair of erect spatulate-clavate ones high up on the occiput. The alitrunk bears three pairs of erect spatulate-clavate hairs, arranged as usual in the *bolaii* group, the petiolar node has its single pair, and the postpetiole its four hairs, with

the middle pair smaller. The first gastric tergite bears 3 pairs (two longitudinal rows of 3 hairs each), and the three sclerotized apical segments each carries a ring of about 12 short clavate hairs. The hairs are not placed in foveae of more than the ordinary size or conspicuousness, and the posterior pair of mesonotal hairs is not separated by a median carina. Petiolar node as seen from the side more narrowly rounded above than in *speciosa*. Color medium ferruginous, appendages lighter.

Holotype a unique worker [Chicago Museum of Natural History] collected by H. S. Dybas (his No. B-31) on Highlands Hammock, Highlands County, Florida, U.S.A., on June 15, 1955, in leaf litter. This first species from the United States is easily told by its specialized erect hairs, reduced to a single pair on the head, and there and elsewhere more slender and more erect than are the corresponding units in the related species.

It is possible that *E. floridana* represents a recently introduced tramp originating farther south in the American tropics, although nothing like it has yet been found anywhere else. It is clearly a specialized member of the *bolaii* group.

#### ***Eurhopalothrix pilulifera*, sp. nov.**

(Fig. 38)

Holotype worker: TL 2.4, HL 0.64, HW 0.57 (CI 89), scape L 0.40, greatest eye diameter about 0.03, WL 0.61 mm.

A small and relatively narrow-headed, but rather typical member of the *bolaii* group, with "full" pilosity, the larger specialized hairs having a subglobular or "pompon-like" aspect as seen from above, or thick inverted spoon-shaped appearance as they are viewed edge-on (see Fig. 38); the broad bodies of the hairs are curved toward the integumental surface and tend to parallel it, the cephalic hairs curving antieriad or antero-mesad, the 3 pairs of alitruncal hairs curving dorsomesad, the petiolar, postpetiolar and gastric hairs curving caudad. Gastric hairs more slender than those on head, arranged in 4 ragged longitudinal rows of 4 hairs each on first tergite.

Ground pilosity well-developed, consisting of abundant whitish oval to spatulate squamiform hairs, appressed and sub-appressed, over dorsum of head and scapes, postpetiole, gaster and legs; less abundant and smaller on promesonotum and petiolar node. Underside of head with fine spatulate reclinate hairs; apex of gaster with fine clavate erect hairs.



Clypeus with anterior 2/3 sloping downward, but not transversely carinate; the sloping part longitudinally tumulose in the middle, on each side of this gently concave; anterior border broadly emarginate. Frontal carina distinct from posterior limit of clypeus to the shallowly impressed mid-vertex. Mandibles triangular, convex above and at the sides; dentition apparently rather fine (no dissection made).

Alitrunk compact, like that of *speciosa* (Figs. 31, 32), continuously convex above in profile and with a distinct but shallow metanotal groove; propodeal teeth broad, lamelliform, their apices subrectangular rather than tooth-like, and their lamelliform ventral continuations only slightly narrowed below. Petiolar node subcuboidal, slightly broader than long. Postpetiole reniform as seen from above, twice as broad as petiole, and about 3/4 the width of gastric segment I.

Densely granulose-punctate, opaque, the punctures more distinct on gaster; clypeus shallowly punctulate, with shining interspaces, its surface as a whole moderately shining. Mandibles feebly shagreened, weakly shining. Color medium ferruginous.

Holotype a worker [MCZ] taken at Chichicastle, Tabasco, Mexico, in berlesate, August 16, 1945 (F. Bonet leg., No. 1108). This is the only worker so far known.

Female paratype: TL 2.4, HL 0.61, HW 0.57 (CI 93), WL 0.65 mm.

The specimen is damaged and lacks all wings but the right hind one. In details of cephalic, clypeal and mandibular shape and pilosity, this female agrees so well with the holotype worker that we are forced to consider them conspecific, despite the fact that the female comes from southeastern Brazil and the worker from Mexico. The usual caste differences separate the two specimens. Scutellum produced as a flat, sharply margined, overhanging shelf, the margin indented in the middle as seen from above. Propodeal teeth stout, triangular, with reduced and sharply receding infradental lamellae. Petiolar node with sharply rounded angle between anterior and dorsal faces. Mesonotum with a sprinkling of short erect spatulate hairs. Hind wing with 4 submedian hamuli; posterior microtrichial fringe long. Otherwise as in holotype worker.

The paratype female [CTB] is from Rio de Janeiro, March 18, 1932 (H. Souza Lopes leg.).

**Eurhopalothrix bolau** (Mayr), comb. nov.

(Figs. 36, 40)

*Rhopalothrix Bolau* Mayr, 1870: 415, nota, female. Type locality: "Surinam". Holotype in NMV, examined.*Rhopalothrix (Rhopalothrix) amoena* Mann, 1922: 39, worker, female. Type locality: La Ceiba, Honduras (by present selection). Other original locality cited: Cecilia, Honduras. Syntypes in USNM, MCZ and elsewhere, several examined NEW SVNONYM.

**Worker:** TL 2.5-2.9, HL 0.60-0.64, HW 0.60-0.63 (CI 96-98), scape L 0.38-0.40, greatest diameter of eye 0.07-0.08, WL 0.66-0.70 mm, based on 6 specimens, including syntypes of *amoena* and a single worker from Progreso, Panama.

**Dealate female, holotype of *bolau*:** TL 3.4, HL 0.73, HW 0.70 (CI 96), WL 0.92 mm.

Head shape and arrangement of the large specialized hairs of cephalic dorsum in female as shown in Fig. 36. The worker is essentially the same, except for the much smaller eyes and lack of ocelli. Note the narrow, gently rounded occipital lobes.

Large specialized hairs present in full complement: 18 on head, 3 pairs on alitrunk, 1 pair on petiole, 2 pairs on postpetiole (middle pair small); on first gastric tergite 2 irregular longitudinal rows of about 4 hairs each. The specialized hairs are flattened spoon-shaped, and their blades are bent so as to lie close to the integumental surface (pseudo-appressed or subappressed). Leading edges of scapes fringed with spatulate hairs; dorsal scape surfaces with smaller subappressed spatulate ground hairs. Ground pilosity well-formed on head, promesonotum, both nodes, gastric dorsum and legs, feeble and inconspicuous on clypeus and mandibles, consisting of small spatulate to simple appressed hairs.

Mandibles with external borders almost straight (very feebly concave); inner borders with 9-11 teeth, of which the basal tooth is offset along the basal border; second and third teeth in some specimens fused into a single large truncate tooth. Alitruncal dorsum divided into a large, rounded promesonotum and a much smaller propodeal dorsum, the latter sloping posteriad and usually weakly convex. Metanotal groove distinct and impressed. Propodeal teeth large, lamelliform, acutely triangular, subdentated by narrow and receding infradental lamellae. Petiole with a rather long, sloping peduncle and a cuboidal node, as seen from above about as broad as long and with convex sides. Postpetiole subreniform and with a very distinct postmedian impression, almost 3 times as broad as petiolar node and about 3/4 as wide as gaster.

Body very finely granulose or shagreened, and in large part densely punctulate, opaque; gaster densely punctulate but shining beneath. Color yellowish-ferruginous to deep reddish-brown.

Variation and synonymy. — The female is darker in color (deep reddish-brown) and has the specialized hairs smaller than in the *amoena* types, but is otherwise very similar.

Material examined. — "Surinam/M. Hamb.", holotype female ex NMV (courtesy of Dr. Max Fischer). Panama: Progreso, Chiriqui Province (F. M. Gaige leg.), a single worker in MCZ. Honduras: La Ceiba (W. M. Mann leg.), 5 worker syntypes of *amoena* in MCZ; further cotypes are in USNM and elsewhere.

### **Eurhopalothrix gravis** (Mann), comb. nov.

(Fig. 35)

*Rhopalothrix* (*Rhopalothrix*) *gravis* Mann, 1922: 40, figs. 19a, b, worker, female, male. Type locality: Lombardia, Honduras (by present selection). Other original locality cited: San Juan Pueblo, Honduras. Syntypes in USNM, MCZ, WWK and elsewhere, several examined.  
*Rhopalothrix Relchenspergeri* Santschi, 1923, Rev. Mus. Paulista, São Paulo, 13: 1263, worker. Type locality: Blumenau, Santa Catarina State, Brazil. At least one worker, apparently a syntype, in NMB, this specimen examined. NEW SYNONYMY.  
*Rhopalothrix* (*s. str.*) *Schmidti* Menozzi, 1936, Arb. morph. taxon. Ent. Berlin-Dahlem, 3: 82, fig. 1-2, 3, 11, III, worker, female, larva. Type locality: La Caja, 8 km. west of San José, Costa Rica. Syntypes in Consani Coll., MCZ, 3 examined. NEW SYNONYMY.  
*Rhopalothrix gravis*, G. C. and J. Wheeler, 1954: 117, pl. 6, figs. 1-10, larva.

Worker: TL 3.0-4.0, HL 0.73-0.87, HW 0.70-0.95 (CI 96-110), scape L 0.45-0.55, greatest eye diameter 0.06-0.08, WL 0.82-1.04 mm, based on 8 specimens from Honduras, Costa Rica and Santa Catarina State, Brazil.

This species is similar to *bolau*, but averages larger and has more angulate occipital lobes (Fig. 35). In specimens from Mexico, Central America and Brazil, the head is distinctly broader (across the occipital lobes) than it is long, but the samples from Dominica in the West Indies are as narrow-headed (CI 96-99) as is *bolau*; the Dominica series are rather small-sized, too (HL 0.73-0.80 mm), and therefore are more or less intermediate between *bolau* and continental *gravis*.

In *gravis*, the pilosity in general is better developed and more distinct than in *bolau*; the pilosity is variable, however, with the series. Specialized hairs longer, more slender and erect, and there usually exist distinct appressed ground hairs on the clypeus (in the *gravis* specimen from Chiapas, however, the pilosity is more as in *bolau*). In the vicinity of the larger specialized hairs of the cephalic dorsum, the ground pilosity is usually notably sparser, much as in *alopéciosa*. In *gravis*, the

sculpture of the head and alitrunk is coarser and more rugulose, particularly in larger specimens. The gastric punctulae are more distinct than in *bolaii*, and the narrow interspaces are smooth and shining on the first tergite. Color medium ferruginous to brownish-black, appendages lighter, usually ferruginous.

**Alate female:** TL 4.5, HL 0.91, HW 1.01 (CI 111), scape L 0.49, greatest eye diameter 0.21, WL 1.20 mm. Forewing L about 3.6 mm; based on a single female from Costa Rica. With the usual differences of caste. Pilosity well-developed; mesonotum with 6 or 7 pairs of slender-spatulate or clavate erect hairs. Color as in the accompanying worker from the same nest series.

**Male unknown.**

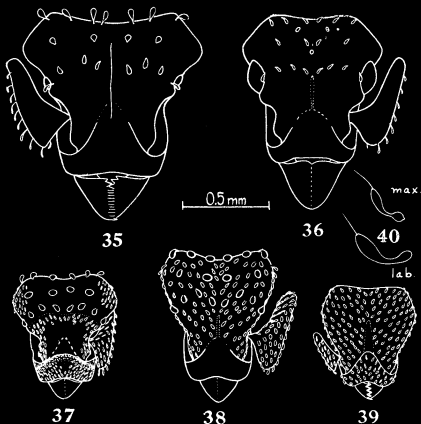
**Variation and synonymy.** — This species, as seen even from the small amount of material available, is very variable in size, color, head width, amount and position, as well as size, of the ground pilosity, and the shape and size of the larger specialized hairs. A Chiapas worker is very dark, almost black, with ferruginous legs, mandibles, clypeus and antennae. The types of *schmidtii*, from upland Costa Rica, are also very dark, and both the Costa Rican and Chiapan specimens tend to have rather small, flattened specialized hairs — especially the Chiapas worker. As already mentioned, the series from Dominica in the Lesser Antilles is narrow-headed and averages small, and could possibly represent a population grading over to *bolaii* in allometrically varying characters, but the material at hand now is insufficient to decide this question. So far as we are concerned, *bolaii* and *gravis* can still be interpreted as distinct species. Whether or not they really are distinct, their known distribution is interesting.

The *reichenspergeri* type, which proves to be an "average" specimen of *gravis* with rather long propodeal teeth and weak ground pilosity, comes from southeastern Brazil, while the other records of *gravis* are from the Lesser Antilles and from Central America north into Mexico. *E. bolaii*, on the other hand, is known from Honduras (near the type locality of *gravis*), Panama and Dutch Guiana. It will be interesting to see whether future collections of these forms bear out the present suggestion that *bolaii* may be a central form within the range of *gravis*.

Syntypes of *gravis* have been compared directly with types of *reichenspergeri* (courtesy of Dr. Fred Keiser of the Naturhistorisches Museum in Basel) and *schmidtii*; the differences mentioned above were noted, but were considered to be only part of the variation normal for this species.

**Material examined:** Mexico: Las Nubes, Volcan de Tacana, Chiapas, ca. 1900 m altitude (C. and M. Goodnight leg.), berlesate from coffee grove, 1 worker. Honduras: Lombardia (W. M. Mann leg.), 12 syntypes of *gravis* in USNM and MCZ; San Juan Pueblo (W. M. Mann leg.), 3 syntypes of *gravis* in WWK, more in USNM. Costa Rica: Hamburg Farm, Limón Prov. (F. Nevermann leg.), 14 workers and 4 alate females [MCZ, CTB]; La Caja, 8 km west of San José (H. Schmidt leg.), 3 syntypes workers in MCZ and Consani Coll. Dominica:

Laudet and Leng Ditton (F. Lutz leg.), 11 workers in MCZ and elsewhere, mixed in with type series of *Rhopalothrix lutzii* = *Octostruma balzani* (q. v.) on the same card mounts. Brazil: Blumenau, Santa Catarina State (ex *Reichenspergeri* Collection), a syntype of *reichenspergeri* in NMB.



*Eurhopalothrix*, New World Species: Fig. 35, *E. gravis* (Mann), ♂ head [syntype]. — Fig. 36, *E. bolauti* (Mayr), ♀ head [holotype]. — Fig. 37, *E. clypeata*, n. sp., ♂ head [holotype]. — Fig. 38, *E. pilulifera*, n. sp., ♀ head [holotype]. — Fig. 39, *E. bruchi* (Santschi), ♂ head [holotype]. — Fig. 40, *E. bolauti* (Mayr), ♀ palpi [Dominica, B.W.I.]. — (Ground pilosity shown in Figs. 37-39).

#### Group of *bruchi*

This group consists, so far as known, only of *E. bruchi* itself. This species is set off from the remainder of the species by its peculiar body form and its uniformly squamate pilosity. It is most like *E. pilulifera* among the *bolauti*-group species, but the relationship does not seem to be particularly close even here. Probably *bruchi* is a specialized offshoot of some *bolauti*-group stock. It is known so far only from northern Argentina.

**Eurhopalothrix bruchi** (Santschi), comb. nov.

(Fig. 39)

*Rhopalothrix Bruchi* Santschi, 1922, An. Soc. Cient. Argent., 94, 256, worker. Type locality: Alta Gracia, Córdoba, Argentina. Syntypes in NMB, MCZ, WWK; 3 examined.

Worker: TL 1.9, HL 0.49-0.50, HW 0.45-0.47 (CI 92-96), scape L 0.22, WL 0.51-0.52 mm. Mandibles very short, protruding beyond clypeus about 0.07 mm at full closure. Based on three syntypes.

Form of head, shown in Fig. 39, generally similar to that of the dacetine ant *Trichoscapa membranifera* Emery. Eyes minute. Clypeus broad and flat, with a deep anterior median emargination. Alitrunk very compact; promesonotum almost flat, with moderately prominent but rounded humeri; metanotal groove distinct, and the constriction of the alitrunk at this point also distinct as seen from above. Propodeum short, widened caudad, the dorsum curving evenly into the declivity; declivity concave from side to side and convexly marginate laterally, the blunt margins each with a fine cariniform margin below. There are no traces of propodeal teeth properly speaking, and the propodeal outline as seen from the side is evenly rounded.

Petiolar node much compressed anteroposteriorly, subtruncate but rounded above as seen from the side, transversely elliptical and nearly twice as long as broad seen from above. Postpetiole also transversely elliptical, broader than petiolar node and more than twice as wide as long. Gaster broader than head, with parallel, only weakly convex sides, composed almost entirely of the first segment, which is boxlike and nearly flat above. Apical segments reduced and more or less ventrally displaced, so that they are scarcely visible from direct dorsal view. Legs short and thick.

Body densely and finely granulose-punctulate, opaque, except for the smooth and shining mandibles. Dorsal surfaces of body, legs, scapes and gula covered with numerous short, inverted spoon-shaped hairs, appressed and subappressed, which appear like small, spaced, semitransparent scales. No larger specialized hairs present on the head, alitrunk or elsewhere; the thick spatulate hairs of the tibial apices are not markedly distinct from the remainder of the squamiform hairs of the tibiae. Color ferruginous yellow.

Female and male unknown.

The only specimens we have seen are the three worker syntypes, which were collected at Alta Gracia by Carlos Bruch from under a stone.

### Group of *brevicornis*

This group includes the old species *brevicornis* (with its synonym *mixta*) and *punctata*, plus two new ones, *australis* and *caledonica*. These are all small species, the counterparts in the Indo-Australian area of the *bolaii* group in the Americas. As can be seen from Figs. 43-46, the occipital lobes are rather square-cut, the mandibles have convex external margins, and three of the species have rather complete patterns of larger specialized head hairs that resemble those of the New World species such as *alopéciosa*, *bolaii*, etc., with two minor differences in detail: in the *brevicornis* group, the anterior row of hairs forms a more regular arch across the head (middle pair of hairs not placed forward of the others), and there are 4 hairs in the posterior occipital row, instead of 6 as in the American species. Behind the head, on alitrunk, nodes and gaster, the erect hairs vary greatly with the species: *brevicornis* may have a single pair straddling the mesonotum, but the other three species have no hairs of this type on the alitrunk; only *australis* has them on the nodes (a single pair each); on the gaster, *australis*, *brevicornis* and *caledonica* have varying complements of hairs arranged more or less in 4 longitudinal rows. *E. punctata* is almost completely hairless, except for the scape fringe and a few clavate hairs at the gastric apex. It is interesting to note that this somewhat aberrant form is partially sympatric with *E. brevicornis*, which may have displaced it ecologically. The group ranges in New Guinea and adjacent islands; the discovery of *australis* (to south Queensland) and *caledonica* (New Caledonia) add considerable range extensions.

### *Eurhopalothrix brevicornis* (Emery), comb. nov.

(Figs. 45, 55)

*Rhopalothrix brevicornis* Emery, 1897: 572, pl. 14, fig. 19, worker. Type locality: Friedrich-Wilhelmshafen = Madang, New Guinea. Syntypes in MCSNG and HNM, several examined.

*Rhopalothrix brevicornis*, Szabó, 1910: 367, female from type locality.

*Rhopalothrix mixta* Szabó, 1910: 366, fig. 4, worker. Type locality: Simbang, Huon Gulf, New Guinea, holotype in HNM (see discussion below). NEW SYNONYMY.

Worker: TL 1.7-1.8, HL 0.42-0.46, HW 0.46-0.50 (CI 109-110), scape L 0.26-0.27, greatest diameter of eye ca. 0.02,

WL 0.46-0.47 mm; based on 7 workers from New Guinea and New Britain.

Head shape shown in Fig. 45. Differs from other members of its group in its smaller size and in shape of alitrunk (Fig. 55) with its abruptly sloping concave dorsal face of propodeum and small subrectangular propodeal teeth. Also the following distinctive characters:

1. Clypeus traversed by a distinct, arcuate carina, separating a large, concave anterior part (covered with small squamiform hairs and opaque) and a small, feebly convex, triangular posterior part (which is nearly smooth, naked, weakly shining). In this feature, surprisingly, *E. brevicornis* resembles *E. clypeata* of the New World (*q. v.*).

2. The arcuate row of 8 large specialized hairs stretching across the vertex between the eyes stands upon a feeble carina that follows the same course. Sometimes a faint trace of such a carina may be seen in other species of the genus, and it appears to be a homologue of the similarly placed carina in *Octostruma rugifera*, *O. rugiferoides*, and some of the *Rhopalothrix* species.

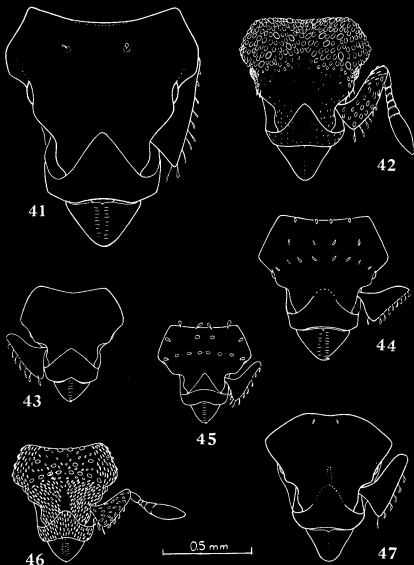
3. Erect specialized hairs short and thick, clavate; 16 on cephalic dorsum; 1 pair straddling mesonotum, in most specimens missing and possibly rubbed off; first gastric tergite with 3 pairs, forming a double longitudinal row, and outside of third (posterior) pair are two more hairs, so that a transverse row of 4 is formed near the posterior edge of the segment. Both petiole and post-petiole lack larger specialized hairs entirely.

4. Petiolar node small and rather rounded above as seen from the side; as seen from above, node transverse, with rounded sides and feebly concave anterior border. Postpetiolar node about twice as wide as petiolar node, and very nearly three times as wide as long,  $3/4$  as wide as gaster.

5. Ground pilosity of appressed and subappressed hairs well developed on head (except for indistinct "bald area" on vertic-occiput), mandibles, scapes, promesonotum, legs, both nodes and gastric dorsum. Color medium ferruginous.

**Female, dealate:** TL 2.3, HL 0.52, HW 0.56 (CI 108), scape L 0.31, greatest diameter of eye ca. 0.12, WL 0.62 mm. With the usual differences of caste. Dorsolateral margins of mesonotum with 6 short, inconspicuous, subreclinate clavate hairs. Color as in worker.





*Eurhopalothrix*, Old World Species: head of worker. — Fig. 41. *E. procera* (Emery) [Australia: Cape York Peninsula]. — Fig. 42. *E. biroí* (Szabó) [New Guinea: Busu R.]. — Fig. 43. *E. punctata* (Szabó) [New Guinea]. — Fig. 44. *E. calcedonica*, n. sp. [paratype]. — Fig. 45. *E. brevicornis* (Emery) [N.E. New Guinea]. — Fig. 46. *E. australis*, n. sp. [paratype]. — Fig. 47. *E. philippina*, n. sp. [paratype]. — (Ground pilosity shown in Figs. 42, 44, 46).

**Variation and synonymy.** — Two workers from New Britain average a little smaller than the sample from northeastern New Guinea and have slightly more convex promesonotal outlines. Through the kindness of Curator Elisabetha Bajári of the Hungarian National Museum we have been able to examine specimens labeled by Szabó himself as

*brevicornis*, *mixta* and *punctata*. There appears to be a mixup in both locality and determination labels on these specimens: of two dealate females labeled as *punctata*, a headless specimen appears to be the true *punctata*, while the other is *brevicornis*. The worker labeled as *mixta* (which could possibly be the *mixta* holotype or another specimen from an original series of the species) is a *brevicornis* specimen. Despite the doubts introduced by the labeling confusion, we think that Szabó's *mixta* must be just the worker of *brevicornis*. His description applies well to *brevicornis*, and it must be noted that he described the *brevicornis* female in the same (1910) paper without reporting additional workers of *brevicornis*. At any rate, there is no sign that more than two species (*brevicornis* and *punctata*) occur now in northeastern New Guinea as representatives of this group, and the specimens in the HNM correspond only to one or the other of these two species.

**Material examined.** — In addition to the HNM material just discussed, and *brevicornis* type material loaned from MCSNG, E. O. Wilson collected a small series of workers and a stray at the Lower Busu River, near Lae, New Guinea, by Berlese funnel from rain forest leaf litter. The MCZ has two workers taken from a bird's-nest fern at Rabaul, New Britain (K. P. Schmidt).

### ***Eurhopalothrix australis*, sp. nov.**

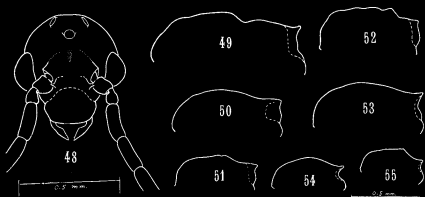
(Figs. 46, 51)

**Holotype worker:** TL 2.2, HL 0.56, HW 0.60 (CI 107), scape L 0.33, greatest diameter of eye ca. 0.04, WL 0.59 mm.

Form of head shown in Fig. 46. General habitus as in *brevicornis* and relatives; size larger than *brevicornis*, smaller than *caledonica*. Clypeus anteriorly plane and sloping forward, with a shallowly impressed median part; posterior median lobe gently convex, without a transverse ridge. Mandibles each with 11 acute teeth (including apical tooth); basal tooth (tooth No. 1) broader at base than the rest; Nos. 1, 3, 5, 7 shorter than 2, 4, 6, 8, 11; Nos. 9 and 10 denticuliform, indistinct.

Promesonotum long, with flat dorsal surface (disc feebly impressed in some specimens); metanotal groove distinct, impressed; propodeal dorsum predominantly concave in outline, sloping caudad and continued as the broad lamelliform propodeal teeth (Fig. 51). Petiole with peduncle and node subequal in length; node subangular in front above, its dorsal face convex, sloping behind, higher than long and, as seen from above, broader than long, with concave anterior border and weakly convex sides. Postpetiole about twice as wide as petiole and nearly 3/4 as wide as widest part of gaster (as wide as anterior border of gaster).

Pilosity of head of the "complete" type for the *brevicornis* group, but with the "bald spot" as in *clypeata*, *alopesciosa* and some *gravis* (see Fig. 37), in which the small ground hairs are sparser and the whitish matter (a secretion?) often found on other surfaces of the head is absent. Subappressed spatulate hairs of the ground pilosity evenly distributed over legs, scapes, postpetiole and gaster, sparser on petiole and promesonotum, very



*Eurhopalothrix*, Old World Species. — Fig. 48. *E. birai* (Szabó), ♂ head [New Guinea: L. Busu R.]. — Figs. 49-55. Outline of worker thorax, pilosity omitted. — Fig. 49. *E. procera* (Emery) [New Guinea]. — Fig. 50. *E. philippina*, n. sp. [paratype]. — Fig. 51. *E. australis*, n. sp. [holotype]. — Fig. 52. *E. caldonica*, n. sp. [paratype]. — Fig. 53. *E. birai* (Szabó) [New Guinea]. — Fig. 54. *E. punctata* (Szabó) [New Guinea]. — Fig. 55. *E. brevicornis* (Emery) [New Guinea].

fine and small on mandibles. No larger specialized hairs on alitrunk, one pair on petiolar node, and one pair on postpetiole (one hair on each posterolateral corner); 14-18 hairs on first gastric tergite, a double row down the middle of the disc, another row flanking these on each side, often incomplete anteriad. The first and the two succeeding tergites each bear a total of 6 hairs in a transverse row near the free margin caudad. The specialized hairs are short but robust and obliquely erect, thicker and more numerous on the gastric dorsum than in *brevicornis*, and shorter, broader and less numerous than in *caledonica*.

Body densely and finely granulose-punctate, as in other members of the *brevicornis* group. Color medium ferruginous, legs and antennae more yellowish.

Holotype [MCZ] a worker from a nest series taken near Crawford's Lookout by the Beatrice River, on the Millaa-Millaa-Innisfail Highway descending from the Atherton Tableland, northern Queensland, in rain forest, February, 1958 (P. F. Darlington leg.).

Paratype workers: TL 2.0-2.4, HL 0.54-0.57, HW 0.58-0.62 (CI 106-109), WL 0.57-0.60 mm. In some specimens the lateral occipital lobes are slightly more angulate at their point of greatest extension, and the sloping lateral borders of the lobes are correspondingly feebly concave. Several specimens, evidently rubbed, lack parts of the pilosity, especially the larger hairs. Otherwise, the paratypes are very similar to the holotype. Paratypes are: 8 workers taken with the holotype and the paratype female [MCZ, WWK, and an Australian Collection as yet unselected]; a single worker, one of several collected, from Mt. Coot-tha, near Brisbane, Queensland, in soil, December 20, 1956, by B. B. Lowery (Coll. Lowery).

Alate female paratype: TL 2.8, HL 0.62, HW 0.66 (CI 106), WL 0.75, forewing L ca. 2.6 mm. With the usual caste differences. Mesonotum with 10 short spatulate erect hairs, mostly near the margins. Petiolar node much compressed antero-posteriorly, narrowly angulate above in front. Venation of forewing basically as in *procera*, but with pterostigma more distinct and with veins *M+CuA* and the apical sections of *Rs*, *M* and *Cu* deleted. Taken with the holotype; deposited in MCZ.

### ***Eurhopalothrix caledonica*, sp. nov.**

(Figs. 44, 52)

Holotype worker: TL 2.9, HL 0.65, HW 0.73 (CI 112), scape L 0.36, greatest diameter of eye ca. 0.05, WL 0.73 mm.

Larger than *brevicornis* and *australis*, but with a similarly shaped head and much the same pattern of cephalic erect hairs. Also the following distinguishing characters:

1. Alitrunk (Fig. 52) with a distinct but broad and rather shallow metanotal groove; dorsal face of propodeum sloping posteriad, with a deep angular impression forming a step-like outline at its midlength as seen in lateral view.

2. Petiolar node as seen from side higher than long, rather narrowly rounded above; as seen from above, node much broader than long, with rounded sides and a nearly straight anterior border. Postpetiole reniform, not quite twice as wide as petiolar node, and nearly 2/3 as wide as widest part of gaster.

3. The small appressed hairs of the ground pilosity are a little less abundant than in *australis* over head and gaster; those

on head are more or less obscured by matter adhering to the surface (a hardened secretion?).

4. The larger specialized hairs are clavate and erect to obliquely erect, much more slender than in *australis*, longer than in *brevicornis*. There are 16 of them on the head (the extra hair occurring beside each eye in *australis* is absent in the holotype and the two paratype workers of *caledonica*). The alitrunk and both nodes completely lack larger specialized hairs, but the gaster bears about 24 short, caudally-inclined clavate hairs, most of which form 4 rough longitudinal rows, on the first tergite. Other clavate hairs on gastric apex and along a median strip on underside of gaster. Color medium reddish-brown, legs lighter.

Holotype [MCZ] a worker, one of three taken separately in rain forest leaf litter berlesates from near Ciu, on the approach to Mt. Canala, 300 M. altitude (E. O. Wilson leg.), December, 1954. The two paratypes are the remaining workers, taken at this locality during January, 1955 [MCZ]. They are virtually identical with the holotype in size and form, though both have lost some hairs, apparently through rubbing. One has a narrower head (HL 0.65, HW 0.70 mm, CI 108). This is the first record of the genus from New Caledonia.

### **Eurhopalothrix punctata** (Szabó), comb. nov.

(Figs. 43, 54)

*Rhopalothrix punctata* Szabó, 1910: 366, fig. 3, worker. Type locality: Friedrich-Wilhelmshafen = Madang, New Guinea, by present selection. Other original localities: Stephansort and Hansemann Mts., New Guinea (see notes under "Variation and synonymy" of *E. brevicornis*, above). Syntypes in HNM, possible type-series female examined.

Worker: TL 1.9-2.1, HL 0.52-0.55, HW 0.57-0.60 (CI 109-110), scape L 0.31-0.32, greatest diameter of eye ca. 0.03 mm, WL 0.52-0.53 mm, 2 workers from different localities measured.

In size and general body form, *punctata* resembles *australis*, but it lacks specialized erect hairs except for those fringing the scape borders, a few clavate ones on the gastric apex, and a few short clavate ones on the gastric undersurface. The appressed ground pilosity is also much finer and less conspicuous than in *brevicornis* and *australis*, especially on promesonotum, nodes and gastric dorsum, so that the body appears naked at first glance.

The vertex bears a shallow impression, and there is no transverse carina on the clypeus. Alitrunk distinctive in form (Fig. 54), lacking metanotal groove. Petiolar node subcubic seen

from the side, but distinctly broader than long as seen from above, with rounded sides and straight anterior border. Post-petiole reniform, less than twice as broad as petiolar node. Color deep reddish-brown.

Material examined (in addition to HNM female; see above under "Variation and synonymy" of *E. brevicornis*): New Guinea, vicinity of Lae: lower Busu River, May 6, 1955 (E. O. Wilson leg., No. 978), and Didiman Creek, March 29, 1955 (Wilson leg., No. 715). Both of Wilson's collections are single strays taken in rain forest leaf litter.

#### Group of *biroi*

In size, the three species *biroi*, *philippina* and *isabellae* are roughly intermediate between the *brevicornis* and *procera* groups. They are rather heterogeneous, sharing the character of having concave (or at least not convex) outer mandibular borders as viewed full-face. The larger specialized hairs are reduced in size (*biroi*) or drastically in number. *E. isabellae* may link the *biroi* and *procera* groups; it shares features of both. The three species are discontinuously distributed in the Solomons, New Guinea and the Philippines.

#### *Eurhopalothrix biroi* (Szabó), comb. nov.

(Figs. 1, 42, 48, 53)

*Rhopalothrix Biroi* Szabó, 1910: 365, fig. 2, worker. Type locality: Hanseemann Mts., New Guinea. Types in HNM, one examined.  
*Rhopalothrix biroi*, Wilson, 1957 (1956), *Psyche*, 63: 21-23, ecology and feeding behavior, Busu River, near Lae, New Guinea.

Worker: TL 2.5-3.0, HL 0.62-0.68, HW 0.68-0.75 (CI 109-111), scape L 0.35-0.38, greatest diameter of eye 0.08, WL 0.70-0.78 mm, measurements from 16 workers representing at least 8 separate collections, all from the Huon Peninsula, New Guinea.

Figs. 1 and 42 will show most of the salient features of this very distinct species. Note especially the striking development of the dorsal cephalic squamiform ground pilosity behind the eye level; the larger specialized hairs in this species are reduced to nearly the same size and shape as the ground hairs, though their arrangement remains fairly typical for the genus. The front half of the head often carries a thin grayish or whitish incrustation, which may be a secretion.

Seen from above, the petiolar node is rather large, about half again as broad as long, with rounded sides and straight anterior margin. Petiolar peduncle with a small, oblique antero-ventral tooth, wholly visible only when the gaster and pedicel are raised. Postpetiole reniform, shallowly longitudinally sulcate above, less than twice as wide as petiolar node.

Color deep reddish-brown, the white squamiform hairs in striking contrast, especially on the head. Female unknown.

Male: TL 2.9, HL 0.52, HW including compound eyes 0.55, WL 0.87, forewing L ca. 2.7 mm. Head as in Fig. 48; note the median pit between the antennal insertions. Compound eye nearly round, diameter about 0.20 mm. Mandibles slender, apparently not opposable, with 1 or 2 vestigial teeth near apices. Mesonotum with shallow but distinct notauli, becoming indistinct posteriad at the stem of the Y. Propodeal teeth small, subrectangular. Petiole subclavate, the node low and rounded, with a distinct posterior peduncle and a small anteroventral tooth. Most of postpetiolar disc and most of gaster (above and below) smooth and shining; sides and apex of gaster finely punctate and only weakly shining. Body otherwise reticulate-punctate and opaque. Forewing venation much as shown for *Creightondris* in Fig. 8, except that  $R_{sf_4}$  fades out before reaching the wing margin (radial cell open), and  $M$  is lacking beyond  $Rs+M$ . Genitalia unremarkable, with blunt, rounded parameres. Color medium orange-brown; ocellar triangle, mesonotum and gastric dorsum infuscated; extremities of appendages lighter, more yellowish.

Variation. — The series available, including the syntype, show no variation of much consequence, except for the moderate differences noted for the mensurable characters, above.

Material examined in addition to syntype worker: Huon Peninsula, New Guinea: lower Busu River, near Lae, April and May, 1955, Nos. 932, 939, 961, 987, 1052, 1058, and an unnumbered lot (E. O. Wilson leg.), 22 workers and two males collected with workers, deposited in MCZ and elsewhere. Also one worker from Bubia, 13 km NW of Lae, New Guinea (Wilson leg., No. 106). Wilson made all of his collections in lowland rain forest, where the ants were foraging in leaf litter and in and beneath rotten logs. He found one small shallow nest in the soil under a rotting log. His observations indicate that the food of this species is principally small, soft-bodied arthropods, particularly entomobryid Collembola, which are stealthily stalked and caught by a sudden jaw snap.

**Eurhopalothrix philippina**, sp. nov.

(Figs. 47, 50)

Holotype worker: TL 2.9, HL 0.66, HW 0.71 (CI 108), scape L 0.31, greatest diameter of eye ca. 0.05, WL 0.78 mm.

Paratype workers (3): TL 2.8-3.0, HL 0.65-0.68, HW 0.70-0.74 (CI 108-109), scape L 0.39-0.40, greatest diameter of eye ca. 0.05, WL 0.77-0.83 mm.

This species is distinct in the shape of its head (Fig. 47) note especially the occipital lobes, with sharply converging postero-lateral borders and gently rounded posterior angles, giving the head a roughly pentagonal outline. The lateral mandibular borders are very feebly concave to approximately straight, depending on how they are viewed.

The alitrunk is like that of *biroi*, except that the propodeal lamellae are much wider in *philippina*. Petiolar node cuboidal, about as high as it is long seen from the side; seen from above, almost as long as wide. Petiolar peduncle with a low, rounded anteroventral process. Postpetiole elliptical, with a faint median impression, almost twice as broad as long and almost twice as wide as the petiolar node.

Erect specialized hairs limited to a single pair of slender clavate ones on the middle of the occiput, a fringe of spatulate ones along the anterior scape margins, and a few clavate ones on the apical gastric segments. Appressed, fine to spatulate ground pilosity very poorly developed, dilute and inconspicuous, only that of legs, gastric dorsum, upper surfaces of scapes and parts of the cephalic dorsum visible under ordinary light at 72X. Color deep reddish-brown, antennae and legs lighter.

Variation among the few paratypes, all from the same series and somewhat attacked by mold, is inconsequential.

Paratype dealate female: TL 3.3, HL 0.69, HW 0.75 (CI 109), scape L 0.42, WL 0.92 mm.

With the usual caste differences. Mesonotum with a few erect narrow spatulate hairs around margins. Ground pilosity a little better developed than in worker, and gastric dorsum with a few (3 in this specimen) erect, slender spatulate hairs on the disc of the first tergite. Interpunctural spaces of first gastric tergite rather smooth and shining, so that the whole surface is subopaque. Color as in worker, but head and alitrunk lightly infuscated above.



Holotype worker [MCZ] and 3 paratype workers with the female paratype [MCZ, USNM] from the vicinity of Dr. J. W. Chapman's vacation "camp" in the Cuernos Mountains, near Dumaguete, Negros, Philippine Islands, altitude about 600 M. (Chapman leg.). This species is easily recognized by means of its oddly-shaped head and reduced pilosity. The only other species of *Eurhopalothrix* known from the Philippines is *E. procera*.

***Eurhopalothrix isabellae* (Mann), comb. nov.**

*Rhopalothrix isabellae* Mann, 1919: 357, fig. 35, worker. Type locality: Isabel Island, Solomon Islands. Holotype in USNM, reviewed by Dr. M. R. Smith.

This species remains known only from the unique type, which we have not personally seen. The head length and width are both about 0.86 mm, so that CI is about 100. As seen in dorsal full face view of the head, the mandibles have distinctly concave outer borders. The body lacks prominent erect clavate hairs except for a pair on the occiput. Petiolar peduncle unarmed beneath. Judging from Mann's figure, this species resembles in general habitus *E. procera*, but the concave outer mandibular borders seem to ally it to *E. biroi* and *E. philippina*.

**Group of *procera***

The *procera* group is a superspecies consisting of two species: the widespread, centrifugally-varying *procera*, and the Fijian relict *emeryi*. These are the largest Old World basicerotines, though still modest in size. The specialized erect hairs are limited on the head to a single pair on the vertex, often small, and alitruncal erect hairs are reduced to one pair or none (worker).

***Eurhopalothrix procera* (Emery), comb. nov.**

(Figs. 41, 49, 56)

*Rhopalothrix procera* Emery, 1897: 572, pl. 14, fig. 18, worker, female. Type localities: Berlinhafen (= Aitape), Selco Island, and Friedrich-Wilhelmshafen (= Madang), New Guinea. Types in MCSNG, reviewed and compared by Wilson, 1955.

*Rhopalothrix procera* var. *ballionii* Forel, 1904, Ann. Soc. Ent. Belg. 48: 175, worker. Type loc.: Morty (= Morotai) Island. Type in MHNG, not seen. NEW SYNONYMY.

*Rhopalothrix borneensis* Wheeler, 1919, Bull. Mus. Comp. Zool., 63: 96, dealate female. Type loc.: Kuching, Sarawak. Holotype in MCZ, examined. NEW SYNONYMY.

*Rhopalothrix procera* subsp. *malua* Mann, 1919: 358, figs. 36-38, male, worker, female. Type localities, all Solomon Islands: Graciosa Bay, Santa Cruz; Pamua, Wainoni Bay and Wal-ai, San Cristoval; Malapaina, Three Sisters; Fulakora, Isabel; Rendova. Syntypes in USNM, MCZ, etc. NEW SYNONYMY.

- Rhopalothrix procera malua* var. *melanotica* Mann, 1919: 360, worker. Type locality: Tulagi, Florida Island, Solomons. Holotype in USNM, examined. NEW SYNONYMY.
- Rhopalothrix Manni* Menozzi, 1923, Bull. Soc. Ent. France, p. 210, fig. 2, worker. Type loc.: Binaluan, northern Palawan I., Philippines (S. Boettcher Coll.). Type presumably in Menozzi Coll., not examined. NEW SYNONYMY.
- Rhopalothrix angulinodis* Stitz, 1925, Sitzb. Ges. naturf. Freunde, Jahrg. 1923: 122, worker. Type loc.: Binaluan, northern Palawan (S. Boettcher Coll.). Syntype and a neotype in MCZ (examined); another syntype presumably in the Stitz Coll. in Berlin. NEW SYNONYMY.
- Rhopalothrix procera* st. *samoana* Santschi, 1928, Insects of Samoa, British Museum, 5 (1): 51, fig. 5, worker, male. Type loc.: Malololelei, Upolu, Samoa. Types in BMNH, NMB and MCZ; one worker syntype in MCZ examined. NEW SYNONYMY.
- Rhopalothrix (Rhopalothrix) kokodensis* Donisthorpe, 1936, Ann. Mag. Nat. Hist. (10) 18: 524, alate female, male. Type loc.: Kokoda, Papua, 1200 feet. Types in BMNH, one male from type series in MCZ examined. NEW SYNONYMY.
- Rhopalothrix (Rhopalothrix) subdentatus* Donisthorpe, 1942, Ann. Mag. Nat. Hist. (11) 9: 67, alate female. Type loc.: Baguio, Luzon. Type in BMNH, not seen. NEW SYNONYMY.
- Rhopalothrix* sp., Brown, 1949, Mushi 20: 25, female from Hotel Tobago I. (Koto Sho) off southern Formosa.

Worker: TL 3.9-5.3, HL 0.92-1.27, HW 0.98-1.35 (CI 106-111), scape L 0.51-0.78, greatest diameter of eye 0.07-0.10, WL 1.07-1.43 mm; based on 44 workers from all parts of the range; see under "Variation and synonymy", below.

Except for *E. emeryi*, this is the largest species of the genus. The form of head and alitrunk are shown in Figs. 41 and 49. The occiput, alitrunk, both nodes and gastric dorsum with a more or less distinct, but shallow and broad, median longitudinal sulcus, in which pilosity is weak or absent.

Petiole node cuboidal, about as broad as long when seen from above. Postpetiole large, a little more than twice as wide as petiole node and about 3/4 as wide as gaster, but only about 1/3 broader than long; posteriorly with a strong median emargination, on each side of which is a low, blunt eminence or lobe.

The pilosity varies considerably (see below), but the pair of erect clavate or spatulate hairs on the paired eminences of the vertex is constant, as is the pair of clavate hairs on the paired pronotal (humeral) eminences, and the circlets of small clavate hairs on the apical segments of the gaster. Erect clavate hairs on the gaster 0-10 (Fig. 56); when present arranged in two longitudinal rows; the more posterior hairs are the most persistent ones in the course of evolutionary reduction of the pilosity. Subappressed spatulate ground pilosity usually best developed on clypeus, scapes, legs and humeri, obsolescent to well developed and abundant elsewhere, according to geographic locality. Sculpture also varying widely geographically, from coarsely and densely rugulose punctate to lightly shagreened-punctate and shining (see below). Color ferruginous to dark reddish-brown.

**Female:** with the usual caste differences; head measurements usually the same as, or slightly greater than, those of the large workers from the same nest series; largest females seen (from the Philippines), measure HW 1.30 and 1.33 mm. The New Guinea females may be a little larger proportionate to their workers, according to the figures of previous authors. Forewing L (3 Philippines specimens) 4.6-5.0 mm (1 specimen from Santa Cruz Islands) 4.2 mm. (For wing venation, see under male, below). Mesonotum with a few erect truncate hairs.

**Male:** TL 3.5-4.2, HL 0.68-0.87, HW 0.68-0.78, WL 1.08-1.31 mm. Greatest diameter of compound eye 0.25-0.27, forewing L 3.3-4.3 mm.

A male of the Solomons Islands populations ("subsp. *malua*") is described by Mann (*loc. cit.*), and the figure with Mann's description will serve for this caste if the considerable variation of males in this species is borne in mind, and if a few corrections are made. Actually, the scape and first funicular segment are stouter than as shown, the ocelli are larger, and the petiolar node is a little higher and more definitely cuboidal. Mann describes the anteroventral process of the petiolar peduncle as "long and slender", although it is not shown in his figure. The process is as Mann says it is in two of his Solomons samples (San Cristoval and Isabel), but is vestigial in a male from Kokoda, Papua, and is absent in one from Babelthup in the Palau Group.

The mandibles are triangular, barely opposable, with rounded basal angle and nearly or quite unarmed masticatory border terminating in an acute apical angle or tooth. Forewing of the type or *Creightondris* (Fig. 8), but more reduced; *M+Rs* and the free apical abscissae of *Rs*, *M* and *Cu* absent or reduced to faint traces. The female venation is similar, except that the *Rs*, though very weak, may reach the wing margin.

On the head there are 2 or 3 pairs of slender erect truncate hairs on the ocellar eminence and other slender hairs elsewhere, especially on the mandibles and gula. Several long erect truncate hairs on each occipital angle in the Solomons specimens, 2-3 on each angle in the Kokoda, Papua, specimen, and none on the angles in the Babelthup specimen. The alitruncal dorsum has sparse, long, curved, tapered hairs, and the gastric apex has slender clavate or truncate hairs. The largest specimen seen (Kokoda, Papua) has HL 0.87 mm, and the sculpture is coarse. The Babelthup specimen is smallest (HL 0.68 mm), but has a

relatively broad head (HW 0.68 mm), and the postpetiole and gastric dorsum are shining. Color deep reddish-brown to blackish-brown, the head darkest.

**Variation and synonymy.** — The variation of several worker-female characters is shown on the map, Fig. 56. In addition to *procera* itself, nine different names have been proposed for forms obviously belonging to the *procera* complex, but which had not all been compared with *procera* by their authors. Among the forms originally based on the worker or female castes, the New Guinea mainland form (typical *procera*) is small (worker HW 0.98-1.04, mean 1.01 mm), lightly sculptured and rather shining, and has reduced pilosity. The Solomons populations ("subsp. *malua*" with its dark variant *melanotica*) averages only slightly larger (worker HW 1.02-1.11, mean 1.06 mm) than New Guinea *procera*, but has definitely heavier, more opaque sculpture and well developed pilosity. The opacity of the sculpture and possibly also the number of erect hairs on Gastric Tergite I increases moderately along a rough cline from the western Solomons to the eastern Solomons and Santa Cruz Islands.

The types of *borneensis* and *angulinodis* represent medium-to-large forms from Borneo and the Philippines (worker HW 1.07-1.35, mean 1.19 mm) with strong, opaque sculpture and abundant pilosity. The species *manni* is from the same type series as what was described two years later as *angulinodis*; Boettcher's collection from Binaluan, Palawan, was split and sold separately, accounting for the double description by Menozzi and Stitz. It is assumed from their descriptions that *subdentatus* and *ballionii* are also opaquely sculptured and otherwise more like the western form. A sample of medium-to-large workers (worker HW 1.11-1.24, mean 1.17 mm) with sculpture of intermediate type and light-intermediate pilosity comes from Cape York Peninsula, Australia, and intermediate sculpture is combined with medium-large size and rather strong pilosity in Samoan samples ("subsp. *samoana*"). Thus all intermediates and all combinations of characters are known in various populations of the *procera* complex. It should be noted that the peripheral forms found farthest from New Guinea are more alike among themselves than any is like the "typical" *procera* of the centrally-placed New Guinea land mass. Further, it should be noted that body size, sculpture and pilosity tend to vary discordantly among themselves over the total range. The likelihood that all populations represent one species, to bear the name *procera*, seems indicated, although the possibility must not be ruled out that one or more of the populations has gone to species level during its isolation by the sea from New Guinea. In any case, in this genus, large size, coarse sculpture and abundant pilosity appear to be primitive characters which in *procera* are being modified by changes moving outward from their center of origin on the New Guinea mainland.

Although we have not seen the female type of Donisthorpe's *kokoensis*, a male from the type series has been examined; surprisingly, this male is larger than the Babelthuap and Solomons males we have seen, and has a relatively longer head, but it is similar enough to be placed with the highly variable males of this species (*procera*). Donisthorpe's characterization of the female, while otherwise almost useless, does mention that the first gastric segment is "shining", thus corresponding to the condition in the New Guinea *procera* workers and females.

Material examined: Dutch New Guinea: Maffin Bay (E. S. Ross leg.), a long series of workers, two of which were compared with the *procera* types at Genoa by E. O. Wilson. Papua: Kokoda, 1200 feet altitude, April, 1933 (L. E. Cheesman leg.), a male from the *kokodensis* type series, sent to W. M. Wheeler by Donisthorpe. Solomon Islands: Fulakora, Isabel I. (Mann leg.). Malapaina (Mann leg.). Wai-ai and Pamna, San Cristoval I. (Mann leg.). Santa Cruz I.: Graciosa Bay (Mann leg.); large series of the Mann collections are in USNM and MCZ. Australia, Queensland: Iron Range, northern Cape York Peninsula, in

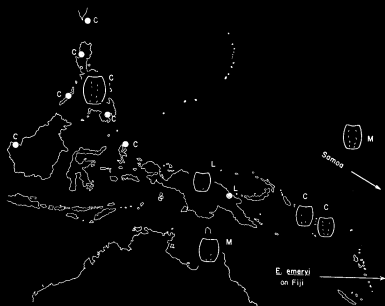


Fig. 56. Geographical variation of size, sculpture and erect pilosity in *Eurhopalothrix procera*, as represented by the first gastric tergite of the worker. Mean relative size is proportional to the size of the figures. Sculpture is indicated by L (light), M (medium), and C (coarse). The average pattern of erect hairs for each locality is drawn in each figure. Large black dots indicate samples for which no drawings were made, but which resemble most those of the nearest drawing in size and pilosity. The Moluccan sample was not seen by us.

rain forest (P. F. Darlington leg.), a small series of workers. Samoa, Upolu: Afiamalu, 2200 feet altitude (E. C. Zimmerman), a small series in the Bishop Museum, Honolulu, and MCZ. Malofolei, under stone (P. A. Buxton and G. H. Hopkins leg.), worker from *samoana* type series in MCZ. Palau Islands: Babelthup I., E. Ngatpang, 65 M. (J. L. Gressitt leg.), male in Bishop Museum, Honolulu. Sarawak: Kuching (J. Hewitt leg.), damaged dealate female holotype of *borneensis* in MCZ. Philippines: Mt. Apo, Mindanao, 1600-2000 M. (C. F. Clagg leg.), a winged female. Binaluan, northern Palawan (G. Boettcher leg.), two workers, one a syntype of *angulinodis* Stütz, and the other with the same locality label, in MCZ. Cebu, near Cebu I. (F. X. Williams leg.), one dealate female in MCZ. Cuernos Mts., 700-1200 M., near Dumaguete, Negros (J. W. Chapman leg.), several series in MCZ and elsewhere. Siaton, Negros (D. Empeso leg.), small series in MCZ. Mt. Banahao,

Luzon (C. F. Baker leg.), one alate female in MCZ. Botel Tobago Island, also called Koto Sho or Lan Yu, off the southern end of Formosa (T. Kano leg.), one female in Coll. Laboratory of Entomology, University of Kyushu.

***Eurhopalothrix emeryi* (Forel), comb. nov.**

*Rhopalothrix emeryi* Forel, 1912, Zool. Jahrb., Suppl. 15: 58, female. Type locality: "Australie", probably in error. Holotype in MHNG, examined.  
*Rhopalothrix (Rhopalothrix) elegans* Mann, 1921, Bull. Mus. Comp. Zool., 64: 467, fig. 25, worker. Type locality: Nadarivatu, Viti Levu, Fiji. Syntypes in USNM, MCZ, etc., examined. NEW SYNONYMY.

HW of type series workers 1.33-1.43 mm. HW of *emeryi* type female 1.41 mm.

This is the only Fijian species of the genus. It is a large, very coarsely sculptured, angular-headed representative of the *procera* superspecies. The subappressed ground pilosity, particularly on the gaster, is broader, more squamose and much more conspicuous than in any of the *procera* populations, and in the workers there are no differentiated erect hairs except short ones on the apical segments. In the female, however, there are 6-10 small erect clavate hairs, smaller than in *procera*, but placed on the first gastric segment in similar lines, one on each side of the middle strip, and undoubtedly homologous with the double row of *procera* workers and females.

In general, *emeryi* has the characters of an "old primitive" population of *procera*, but in such exaggerated form (except for the erect gastric hairs) that it seems likely to be a distinct species within superspecies *procera*.

Forel described *emeryi* from a female which he said was from "Australie. Ma Collection". Through the courtesy of Dr. C. Besuchet, of the Museum d'Histoire Naturelle of Geneva, we have been able to examine the holotype of *emeryi* and to compare it with syntype workers of *elegans* and a winged female of this species from Nadarivatu, Fiji (E. C. Zimmerman leg.); they show good agreement. We believe that Forel's original locality citation was based on an error, and until contradictory evidence is forthcoming, we consider that *emeryi* is restricted to Fiji. In addition to Viti Levu, it has been taken on Vanua Levu and Ovalau in the Fiji Islands.

***Rhopalothrix* Mayr**

*Rhopalothrix* Mayr, 1870: 415. Type: *Rhopalothrix cillata* Mayr, 1870, by designation of Wheeler, 1911.  
*Rhopalothrix* subgenus *Rhopalothrix*, Emery, 1922: 329.  
*Heptastruma* Weber, 1934: 54. Type: *Heptastruma wheeleri* Weber, 1934, by original designation, monobasic. NEW SYNONYMY.  
*Acanthidris* Weber, 1941: 188. Type: *Acanthidris isthmicus* Weber, 1941, by original designation, monobasic. NEW SYNONYMY.  
*Rhopalothrix* Brown, 1948: 102, 125; Brown, 1949: 92.

The seven species here included in *Rhopalothrix* are all known only from workers or females; males, while still unrecorded, are probably similar to those of *Eurhopalothrix*. The *Rhopalothrix* females and workers are like those of *Eurhopalothrix*, and have 7-segmented antennae, but the heads tend to be wider and the eyes smaller. The worker eyes in at least one species are either absent or so minute that they cannot be distinguished by ordinary microscopic examination of the integument of dry specimens. The chief difference lies in the mandibular structure. The mandibles are slender and inserted far apart; the insertions are covered by slight rounded projections of each side of the anterior clypeal border. The mandibular blades are nearly straight to somewhat curved, tapering from base toward apices, and crossing or engaging only near their apices (Figs. 57-61). The inner border of each mandible is lined with a few small, sharp teeth or denticles, irregularly spaced, and near the apex with a long spiniform tooth (subapical tooth). After the subapical tooth, the mandibular apex is bent sharply ventrad, and the apical tooth is more or less enlarged and spiniform, thus forming with the subapical tooth an "apical fork" somewhat like that of the dacetine ant genus *Strumigenys* or the ponerine genus *Odontomachus*. Between these two larger teeth, there are normally two or more small intercalary teeth. The closed mandibles frame a more or less considerable triangular space, within which the labrum is prominent. The labrum is broad and shield-shaped, with the twin anterior lobes varying widely in form and position according to the species.

Some of the species show a more or less distinct tendency for the cephalic dorsum to bear a transversely arched sulcus, or 2 sulci with an accompanying blunt ridge (Fig. 57). The body otherwise varies with the species, but the variation does not depart significantly from that seen in *Rhopalothrix* or *Octostruma*. Size is small to very small, and the color is varying shades of ferruginous. The pilosity varies widely, from abundant to virtually absent, and when present assumes a number of forms, especially clavate or squamose. The hair patterns of the head in species like *R. ciliata* or *R. diadema* are similar to those in some species of *Eurhopalothrix*. Sculpture varies from densely and finely reticulate-punctate to irregularly granulose.

The female of *R. kusnezovi* is known, and this has large compound eyes and full flight apparatus.

The unfortunate history of the application of the name *Rhopalothrix* has already been discussed above. We now recognize seven species as belonging to the group; four of these species are described as new in these pages. Of the three older species, one (*ciliata*) is the type of the genus, one is the type of *Heptastruma*, and one is the type of *Acanthidris*. The synonymy of *Acanthidris* presents no difficulties; its type and sole species (*isthmicus*) is clearly linked to *R. ciliata* and the three new species. *Heptastruma wheeleri*, type and sole species of its genus, was described from a single specimen, of which the head had been mounted on a slide in euparal. This specimen is now badly fragmented, but a reexamination by Dr. Weber and by Brown establishes that the original figure and description were distortions of its actual condition. The mandible is really much like that of all the other species of *Rhopalothrix* (in the present sense), and only relatively minor differences exist between this and the other small species, especially *plaumanni*, *stannardi* and *isthmica*.

The species of *Rhopalothrix* are all apparently exceedingly rare; none of them is known away from its type locality; most are recorded from only one or two examples. Six of the known species are neotropical, from widely scattered localities ranging from Chiapas and Cuba south to Argentina. The seventh species comes from northeastern New Guinea. This distribution and the structural diversity of the seven species suggests a great age and former widespread occurrence of the genus. Little is known of the biology; the species occur in forest leaf litter or in subterranean habitats elsewhere. The collections are of strays, usually from siftings or berlesates.

### *Rhopalothrix ciliata* Mayr

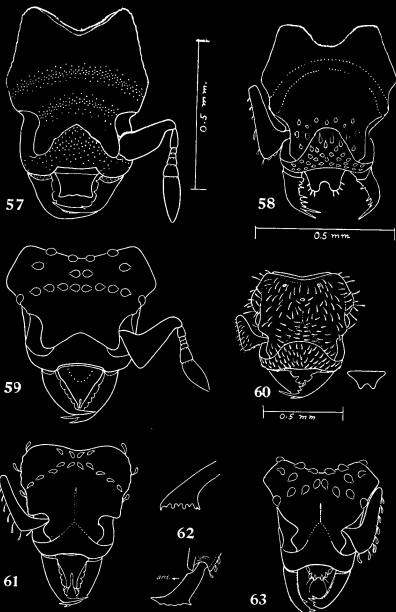
(Fig. 61)

*Rhopalothrix ciliata* Mayr, 1870: 415, worker. Type locality: Santa F , Bogot , Colombia. Types in NMV; lectotype by present selection so labelled.

Lectotype worker: TL 3.1, HL 0.69, HW 0.66 (CI 96), ML 0.32, WL 0.75 mm.

The arch of large hairs from eye to eye is set in a broad and very shallow sulcus. In addition to the large hairs shown in the figure, there are numerous small, appressed squamose hairs covering the dorsum of the head, including the clypeus, labrum, and the upper surfaces of the scapes. Small hairs are present but inconspicuous on the alitrunk dorsum, where a whitish incrustation hides the surface; this also present on dorsum of occipital lobes, center of head and both nodes. Short simple hairs, oblique to reclinate, on mandibles, flexor margins of scapes, gula, legs, and sparse between larger hairs of gaster. Promesonotal suture indicated by a feeble sulcus; metanotal groove deep and abrupt. One erect cochlear hair on each side of mesonotum; one pair of posteriorly-inclined clavate hairs on petiolar node, 6 clavate hairs near posterior edge of postpetiole, and numerous obliquely erect clavate hairs evenly spaced over





*Rhopalothrix* and *Talaridris*  
 Fig. 57. *R. stannardi*, n. sp., ♀ head [holotype]. — Fig. 58. *R. plaumanni*, n. sp., ♀ head [paratype]. — Fig. 59. *R. diadema*, n. sp., ♂ [paratype]. — Fig. 60. *R. kusnezovi*, n. sp., ♀ head with labrum [holotype]. — Fig. 61. *R. ciliata* Mayr, ♀ [lectotype]. — Fig. 62. *T. mandibularis* Weber, ♂ mandibles [holotype]. — Fig. 63. *Idem*, ♀ head [holotype]. (Fig. 59 drawn to scale of Fig. 57; Figs. 61 and 63 to scale of Fig. 60).

both surfaces of gaster. Body densely reticulate-punctulate, opaque; gaster and mandibles not quite so densely punctulate, weakly shining to subopaque.

The "apical fork" is composed of the long dorsal (subapical) and a slightly shorter ventral (true apical) tooth; between are two small subequal intercalary teeth.

Dull ferruginous, legs more yellowish.

***Rhopalothrix weberi*, nomen nov.**

*Heptastruma wheeleri* Weber, 1934: 55, fig. 13, worker. Type locality: Casa Harvard, near Central Soledad, Las Villas Prov., Cuba. Holotype in Coll. Weber. Preoccupied in *Rhopalothrix* by *Rhopalothrix* (*Octostruma*) *wheeleri* Mann, 1922 (= *Octostruma wheeleri* of the present revision).

As already mentioned, the head of the type worker was mounted in euparal on a glass slide, and the mandibles are now separated from the head and fractured. Still, it is possible to determine from the specimen as it is now that wide differences exist between the actual mandibles and Weber's representation of them, probably owing to distortion caused by an original tilting of the specimen in the medium. There is nothing to bear out Weber's original depiction of the basal half of the mandible as abruptly broadened, though a break in one blade may have led to confusion of the mandible with the lateral part of the labrum here. The mandible has a stout spiniform subapical tooth, with a reclinate denticle just proximad of its base. The apical tooth is broken off at its base in the mandible available, and it is now impossible to say whether it was equal to the subapical tooth, as Weber's figure shows it. Between apical and subapical teeth are two intercalary denticles. The basal half of the inner (masticatory) border of the mandible is unfavorably situated, and its armament is unknown. From what can be seen of this mandible, labrum, and cranium, *weberi* can be distinguished from *isthmica* only by its shorter subapical mandibular tooth and its sharper transverse crests on the dorsum of the head. From *R. stannardi* sp. nov., *weberi* differs chiefly in having a deeply cleft labrum. Weber thought that the eyes were entirely absent, but they may be merely extremely reduced, as in the related species. In Weber's figure, the propodeal lamellae are shown without an acute tooth or sharp angle above, but only with a rounded angle; *isthmica* and *stannardi* both have an acute tooth above on each propodeal lamella.

This species is known only from the holotype, taken "in red clay from under stones and grass roots which had been run through a Berlese funnel".

**Rhopalothrix isthmica** (Weber), comb. nov.

*Acanthidris isthmicus* Weber, 1941: 188, figs. 4-7, worker. Type locality: Barro Colorado Island, Panama Canal Zone. Holotype in Coll. Weber.

Dr. Weber has loaned me the holotype of this species, and I have seen one additional topotypic specimen (J. Zetek leg.) at present in the USNM. Holotype: TL 2.7, HL 0.52, HW 0.59 (CI 113), WL 0.55 mm. Weber's figures provide a reasonably good likeness of this form, except for the detail of the condylar gibbosities (stronger and more projecting than as shown) and the bases of the mandibles (the strong, arcuate basal mandibular border, which opposes the condylar gibbosity, is not shown in Weber's figure). The masticatory margin bears, in addition to the subapical spiniform tooth and the reclinate tooth at its base, one fairly large tooth and four smaller teeth or denticles; two of these denticles are placed close together just at the basal end of the masticatory border. The subapical tooth is about 0.12 mm long.

The transverse crests are both present, but indistinct, and the corresponding sulci are correspondingly feeble. The labral shield is divided to near its midlength by a deep notch, so that two narrowly rounded lobes bearing the trigger-hairs are left outstanding. The lateral occipital borders are sinuate or bigibbose, and the posterior occipital excision is deeper than as shown in Weber's figure.

**Rhopalothrix plaumanni**, sp. nov.

(Fig. 58)

Holotype worker: TL 1.85, HL 0.43, HW 0.47 (CI 108), ML 0.13, WL 0.51 mm.

Form of head and mandibles shown in Fig. 58. This is a close relative of *weberi* and *isthmica*. Note the small, single-facetted eyes and the deeply notched bilobed labral shield. Following are the main distinctive characters:

1. Dorsum of head lacking the pair of well-defined and moderately arched transverse ridges and sulci of *weberi*; instead only a feeble, blunt and strongly arched posterior ridge is present. Disc in front of this ridge flattened to weakly concave.

2. Mandibles relatively short, at their bases only about half as wide as the labral shield. Dentition of masticatory margin, from base to apex, as follows: 2 blunt and indistinct denticles,

1 smaller acute tooth, a indistinctly denticulate diastema, 2 longer acute teeth, the basal slightly longer than the distal, 1 very long spiniform subapical tooth with a small reclinate denticle at its base, 2 small intercalary teeth on apical fork, the first usually rudimentary, 1 spiniform long apical tooth, subequal in length to subapical tooth, the latter slightly longer than width of mandibles at base.

3. Anterior clypeal margin feebly concave as in *weberi*, the lateral condylar gibbosities not as prominent as in *isthmica*.

4. Thoracic dorsum rather flat. Promesonotal suture vestigial. Metanotal groove extremely shallow and scarcely impressed. Propodeal spines subrectangular, not acute as in *isthmica* nor blunt as in *weberi*; infradental lamella, as seen in profile, weakly but evenly concave. Petiole with a rather short peduncle.

5. Erect pilosity extremely scarce, apparently confined to gastric apex (exposed portions of tergites and sternites II-IV each bearing a transverse row of several spatulate hairs), and leading edge of scape (with 2 reclinate spatulate setae basad, 6 standing spatulate setae apicad of elbow). Extensor surfaces of tibiae at apices and of the tarsi their length with conspicuous, short, inclined, paddle-shaped hairs. Clypeus and adjoining areas of front with conspicuous oval or round subappressed setae, as shown in Fig. 58. Ground pilosity consisting in minute, sparse, thickened standing setulae, arising from the punctures on head, thorax, and tergites and sternites of gaster.

6. Sculpture as in *isthmica*, normally exposed surfaces opaque, punctulate-granulose with minute tuberculae. Color fuscous-brown; mandibles, clypeus, antennae, legs rather sordid testaceous.

Holotype a worker taken from sifted soil cover at Nova Teutônia, Santa Catarina, Brazil (F. Plaumann leg.), deposited in WWK (from CTB). Another worker paratype from the same collection (MCZ), has the following measurements: TL 1.75, HL 0.42, HW 0.47 (CI 113), WL 0.49 mm, but is otherwise identical with the holotype.

***Rhopalothrix stannardi*, sp. nov.**

(Fig. 57)

Holotype worker: TL 2.7, HL 0.54, HW 0.56 (CI 104), ML 0.15, WL 0.55 mm.

Very similar to *R. isthmica*, but differing in the narrower head and otherwise as follows:

1. Blunt transverse crests across head, and corresponding sulci, well defined; more as in *R. weberi*. Sides of occipital lobes nearly evenly rounded. Eyes minute, each with a single facet.

2. Mandibles more slender, at their bases only about half as wide (0.09-0.10 mm) as the labral shield; in *isthmica*, the mandibular bases are distinctly more than half as wide as the labral shield. Subapical tooth about 0.12 mm long, slender and acute, feebly recurved. Dentition (basad of reclinate tooth at base of subapical tooth) consisting only of a subbasal denticle, a small middle tooth, and beyond the latter another very small denticle. The downturned apical tooth is only about 1/3 the length of the subapical tooth, from which it is separated by two smaller but acute intercalary teeth.

3. Labral shield broader than long, sides subparallel and nearly straight, anterolateral corners subacute; anterior margin broadly and very shallowly concave, and within this feebly trimarginate or sinuate, in no sense deeply excavated or notched. Each anterolateral corner bears a stout, tapered, anteriorly directed "trigger-hair".

4. Propodeal teeth with more evenly rounded infradental lamellae. Petiolar node more rounded behind, and with only a feeble ventral swelling. Alitrunk in profile appearing more evenly, and very gently, convex; metanotal impression very feeble.

5. Erect pilosity as in *R. isthmica*, but slightly less abundant and conspicuous, largely confined to angles of scapes and apical half of gaster. Extensor surfaces of tibiae at apices, and of the tarsi their lengths, with conspicuous short, inclined, paddle-shaped hairs. Underside of gaster just before apex with 10-12 peculiar, short, thorn-like projections, irregular in size, position and inclination, appearing to be outgrowths of the integument, but which may be either artifacts or modifications of the blunt setae found in the same positions on *R. isthmica*. Pubescence suppressed, apparent only toward gastric apex, where quite sparse.

6. Sculpture as in *R. isthmica*, normally exposed surfaces opaque, punctulate-granulose with minute tuberculae. Color sordid testaceous, head and anterior alitrunk slightly more brownish.

Holotype a unique, taken by Berlese or other sifting apparatus at Finca el Real, Ocosingo Valley, Chiapas, Mexico, July 1-7, 1950 (C. and M. Goodnight and L. J. Stannard leg.); deposited in MCZ.

***Rhopalothrix kusnezovi*, sp. nov.**

(Fig. 60)

Holotype female, alate: TL 2.9, HL 0.62, HW 0.65 (CI 105), ML 0.18, greatest diameter of compound eye ca. 0.12, WL 0.83, forewing L ca. 2.5 mm.

Form of head and mandibles as shown in Fig. 60. Two weak, feebly arcuate sulci crossing head, one just behind clypeus, the other just in front of anterior ocellus. Curved transverse carina behind ocelli is shown by dotted line in figure. Clypeus flat, with raised convex lateral lobes. A brief median longitudinal carina runs forward from anterior ocellus. Labrum shown in Fig. 60. Antennal scapes flattened and bent near base, and somewhat broadened, but not forming prominent lobes (in Fig. 60, scapes are shown in foreshortened view). Apical segment of funiculus about as long as the five basal segments combined. Mandible with 3 large and 2 small teeth on masticatory border, followed by the long subapical tooth, which is nearly twice as long as basal width of mandible and more than twice as long as (ventral) apical tooth; between subapical and apical teeth are two strong intercalary teeth.

Alitrunk depressed and broad; pronotum broad above, but the sides concave and receding beneath it; scutum depressed, with an extensive shallow impression centered between the wing bases. Scutellum elliptical, flat, feebly impressed, not protruding. Propodeum with extremely short dorsum almost immediately dropping off into declivity, which is concave from side to side, and laterally bordered on each side by a low translucent lamina which is convex above and below, concave in the middle.

Petiole sessile, its anterior face rising at a sharp slope, slightly convex; summit rounded, posterodorsal face convex; seen from above, node is subrectangular, broader than long, anterior and lateral borders slightly convex. Anteroventral process short and stout. Postpetiole reniform, wide, but narrow from front to rear, its anterior border gently concave, its posterior border convex. Gaster depressed and rather broad, with subparallel sides; first tergite flat above, with a broad but shallow antero-median impression. Exserted sting stout, acute.

Entire body, including mandibles, densely and finely granulose-punctulate, opaque; occiput and promesonotum with a faint open network of rugulae superimposed. Posterior dorsum of head, gula, scapes, dorsum and lower middle sides of alitrunk, coxae, both nodes and all of gaster covered with abundant,

rather short but slender, clavate to truncate erect hairs. Legs, frontal region of head, and clypeus with reclinate linear-spatulate hairs, often directed toward midline on head; mandibles with long, decumbent truncate to pointed hairs (the last not shown in the figure). Labrum with paired tapered sensory setae.

Venation of forewing reduced to a rather weak  $R+Sc$  with stigma. Costa of forewing basad of stigma with 3 large equally-spaced oblique setae. Hindwing with 4 submedian hamuli. Color medium ferruginous; ocellar calli blackened.

Holotype [IML] taken, presumably in or after nuptial flight, at Tucumán, Argentina (N. Kusnezov leg., no. 10068). Two similar paratype females, also from Tucumán, are deposited with the holotype and WWK. Worker and male unknown.

This species is most closely related to *weberi*, *isthmica*, and *stannardi*, but differs strikingly from all of these in its abundant and bristly pilosity, as well as in labral form and other characters.

### **Rhopalothrix diadema**, sp. nov.

(Fig. 59)

Holotype worker: TL 2.2, HL 0.52, HW 0.61 (CI 117), ML 0.22, WL 0.53 mm.

Head shape as in Fig. 59. A very shallow sulcus crosses head just in front of the anterior arc of large round hairs. Eyes minute, each situated on underside of dorsal scrobe border and beneath one of the large hairs, so not visible from dorsal full-face view. Mandibles narrow, curved, with 4 or 5 spaced denticles; subapical tooth longer than basal width of mandible and slightly longer than (ventral) apical tooth; between subapical and apical teeth 2 blunt, indistinct intercalary denticles. Labrum flat, but with a large mediobasal tumulus (indicated by a dotted line in the figure) and a shallow anteromedian longitudinal sulcus leading to the tiny groove between the two narrow lobes, which together with their short, approximated sensilla, form an acute apex to the lateral shield. Antennal scapes convex above, but with a concave strip along the anterior edge.

Alitrunk compact, convex in outline, its summit at the posterior edge of mesonotum. A broad but shallow sulcus separating pro- and mesonotum, and a slight metanotal groove separating mesonotum from downsloping propodeal dorsum. Seen from above, pronotum much broader than long, with rounded

sides; mesonotum much smaller, subcircular; distinct constriction at metanotal groove; sides of propodeum convex in front. Propodeum with median portion of surface continuous from dorsum to declivity and concave from side to side, guarded on each side by an obtuse angle (vestige of the propodeal tooth) trailing a low cariniform lamella below.

Petiole with a distinct but broadly conical peduncle and a rounded node, distinctly broader than long as seen from above. Postpetiole subreniform, nearly twice as wide as petiolar node and about  $2/3$  as wide as widest part of gaster. Gaster oval, convex above and below, without a dorsal sulcus or impression.

Entire body densely and finely granulose-punctulate, opaque; promesonotum and petiole with fine superimposed rugulae. Ground pilosity consisting of round, white, subappressed squamiform hairs, abundant over head, scapes, labrum, promesonotum, legs, both nodes and gaster; largest on clypeus, pronotum, tibiae and gaster; smaller and inconspicuous on mandibles and petiolar node. Larger specialized hairs are shaped like the inverted bowls of broad, flat spoons lying close to and paralleling the integumental surface; in perpendicular view, they look like large, round white scales: 18 on head, arranged as shown in Fig. 59; 2 pairs on mesonotum, 1 pair on posterior petiolar node, 1 pair on posterolateral corners of postpetiole; about 24 on first gastric tergite; 2 hairs at each tibial apex. Gastric apex with more or less erect clavate hairs both above and below. Color light ferruginous.

Holotype worker [MCZ] taken in a soil-leaf litter berlesate from lowland rain forest on the lower Busu River, near Lae, New Guinea (E. O. Wilson leg., no. 1052). In the same Berlese sample were associated the ant species *Eurhopalothrix biroi*, *E. brevicornis* and *Dacotinops cibdela* Brown & Wilson.

Three paratype workers also from the same sample vary slightly in size and proportions: TL 2.1-2.4, HL 0.51-0.55, HW 0.59-0.65 (CI 116-118), ML 0.21-0.22, WL 0.52-0.56 mm, but are otherwise very similar. Paratypes in MCZ, USNM, WWK.

This species appears to be most closely related to *R. ciliata*, especially in shape of head and mandibles, as well as in the pattern of head pilosity. Female and male unknown.



**Talaridris Weber**

= *Talaridris* Weber, 1941: 184. Type: *Talaridris mandibularis*, by original description, monobasic.

**Worker and female:** Antennae with 7 segments total. Very similar to *Rhopalothrix*, but with somewhat different mandibles. These are elongate as in *Rhopalothrix*, but curve dorsad from the plane of the head (Fig. 62), finally broadening into an obliquely oriented apical masticatory border with acute and rounded teeth as shown (slightly foreshortened) in Fig. 62. There are inconspicuous denticles arranged along the inner dorsal margins of the blades also. Of the apical series, the largest acute teeth, one at each end of the series, may correspond to the long, acute subapical and ventral apical teeth forming the "apical fork" of *Rhopalothrix*, in which case the intervening teeth would represent elaborations of the two intercalary teeth or denticles of *Rhopalothrix*. In fact, the distinction between these two genera is relatively trivial, and when more species of *Rhopalothrix* become known, it may well prove advantageous to merge *Talaridris* with it.

**Male unknown.** The single species, *T. mandibularis*, is known only from collections in British Guiana and Trinidad, where it has been found as strays taken in leaves or humus on the forest floor.

***Talaridris mandibularis* Weber**

(Figs. 62, 63)

*Talaridris mandibularis* Weber, 1941: 185, figs. 1-3, worker, female. Type locality: foothills north of Tunapuna, Trinidad, West Indies. Additional original localities: Ridge north of Tunapuna, Trinidad, 1580 feet altitude, Oke R., British Guiana; types deposited with NAW; holotype worker and paratype female examined.

**Holotype worker:** TL 3.0, HL 0.70, HW 0.73 (CI 104), ML 0.26 (MI 37), WL 0.73 mm.

Shape of head and mandibles shown in Figs. 62, 63. A fine median carina runs from posterior clypeal angle to vertex. Eyes minute, hidden from full-face dorsal view by one of the large spoon-shaped hairs on each side of the head. Alitrunk with a broad and deep metanotal groove. Propodeal teeth acutely triangular, lamelliform. Petiole pedunculate, node rounded above, with gently sloping, convex posterodorsal face; node seen from above narrow, rounded in front, longer than broad; peduncle with a stout oblique process at its anteroventral extremity. Postpetiole large, nearly 3 times as broad as petiolar node,

subreniform, excised in front; posterior border, though generally convex, has a weak median and two flanking emarginations.

Body densely and finely punctulate-granulose, opaque; occipital area and promesonotum with coarser punctures also, and on the occiput the surface is even slightly rugulose. Head, promesonotum and nodes with a moderate whitish incrustation of hardened material, especially in the punctures; possibly this is a secretion.

Upper surfaces of scapes, lateral surfaces of mandibles, and legs with a covering of small, oval, subappressed squamiform hairs; ground pilosity otherwise obsolete or nearly so. Hairs bordering scapes along its anterior edge spatulate, curved. Large thick, inverted spoon-shaped hairs form a pattern on the head as shown in Fig. 63. Similar hairs elsewhere on body (the full complement inferred from a slightly abraded specimen): 1 pair on pronotum; 1 pair on mesonotum; 1 pair on posterior petiolar node (another pair may have been present on the front of the node, now missing); 4 hairs on posterior petiolar node, the middle pair small; about 16 hairs on gastric tergite I, arranged in 4 longitudinal rows; a few smaller hairs on each gastric apical segment; one hair at each tibial apex. Gula with a few slender, curved, truncate hairs. Color sordid yellowish ferruginous.

**Paratype female:** TL 3.2, HL 0.75, HW 0.73 (CI 97), ML 0.26 (MI 35), WL 0.83, greatest diameter of compound eye 0.15 mm. In addition to the surprisingly narrow head, the female differs in the usual ways from the worker caste. Alary sclerites with 12 of the thick erect hairs, mostly bordering the dorsal surface, 1 pair discal on the scutum. First gastric tergite with 20 or more of the large hairs.

**Material examined:** Only the holotype and female paratype have been critically examined; type localities are cited in the synonymy above; N. A. Weber personally collected all of the specimens, Weber's field notes indicate that this species is a cryptic forest-floor forager in forested country; its structure and dacetine-like habitus suggest that it is predaceous.

#### **Incertae sedis**

#### ***Rhopalothrix redux* Donisthorpe**

*Rhopalothrix (Rhopalothrix) redux* Donisthorpe, 1939, Proc. R. Ent. Soc. Lond. (B) 8: 152, male. Type locality: Kaieteur Savannah, British Guiana. Holotype, a unique, in BMNH.

Since we do not at present know what, if any, differences separate the males of *Rhopalothrix*, *Eurhopalothrix*, *Octostruma*,

and *Talaridris*, it is impossible to assign *redux* to one of these genera. Very likely it is the male of a species already known from the worker or female in one of these four genera. Donisthorpe gives the length as 3.3 mm, and says that the mandibles are "small, external border rounded, masticatory border furnished with 7 or 8 small sharp teeth, apical tooth slightly longer".

#### Key to the genera of Basicerotini, based on workers and females

1. Antennae 12-segmented . . . . . 2
- Antennae 7- or 8-segmented . . . . . 4
2. Dorsal surface of basal half of each mandible bearing a deep, transverse-oblique groove running outward from the masticatory border; apical part of mandible sharply downcurved (Fig. 5) . . . . .  
*Creightonidris* Brown  
(One species: *C. scambognatha* Brown, neotropical)
- Mandibles without conspicuous dorsal transverse groove, their dorsal surfaces only moderately convex to apices . . . . . 3
3. Posterior half or more of head more or less disc-like, subcircular in outline, the free margins with a strong, continuous or nearly continuous raised flange (Figs. 6, 7) . . . . . *Aspididris* Weber
- Posterior half of head subrectangular or trapezoidal, not disc-like, the free lateral borders of the occiput distinct from the posterior border, and not or incompletely marginate (Figs. 2, 3, 4) . . . . .  
*Basiceros* Schulz
4. Antennae with 8 segments (mandibles triangular and serially dentate; Figs. 15-30; New World) . . . . . *Octostruma* Forel
- Antennae with 7 segments (mandibles triangular or linear; Old World and New World) . . . . . 5
5. Mandibles triangular, their whole serially dentate masticatory borders engaging directly at full closure (Figs. 33-47; Old World and New World) . . . . . *Eurhopalothrix* Brown and Kempf
- Mandibles linear, their insertions remote, so that their masticatory borders cross or engage only near their apices (Figs. 57-63) . . . . . 6
6. Mandibles each with a long, conspicuous spiniform tooth near the apex (Figs. 57-61; New World and Old World) . . *Rhopalothrix* Mayr  
(= *Heptastruma*, *Acanthidris*)
- Mandibular apices with interlocking teeth, but none notably long (Figs. 62, 63) . . . . . *Talaridris* Weber  
(One species: *T. mandibularis* Weber, neotropical)

#### Key to the species of *Basiceros* (Workers and females)

1. Vertex and occiput continuously convex (except for median longitudinal sulcus); head broad (worker CI over 92); labrum long and narrow, with a distinct median division or groove (Figs. 4, 12; se. Brazil)  
*convexiceps* (Mayr)
- Vertex raised above concave surfaces of occipital lobes; head less broad (worker CI under 92); labrum broad, convex, with rounded free margin, lacking a median groove visible from dorsal view . . . 2

2. Head narrower (worker CI under 75) and more parallel-sided; clypeus and mandibles with abundant and conspicuous whitish appressed squamiform hairs; petiole with 1-3 ventral processes, and usually at most one of these is well-developed and spiniform; base of first gastric sternite with a short but sharp longitudinal carina (Figs. 2, 13) (Amazon-Guianas area)..... *singularis* (Fr. Smith)
- Head wider (worker CI over 75) and more triangular; clypeus and mandibles with punctures, but no appressed hairs; petiole with 4-7 ventral processes, usually all or nearly all of them slender spiniform; base of first gastric sternite without a short sharp longitudinal carina (Figs. 3, 11; Honduras, Costa Rica)..... *manni* Brown & Kempf

#### Key to the species of *Aspididris* (Workers and females)

1. When head is viewed full-face, the arcuate flange or crest around the back of the head is medially emarginate and confluent at this point with the central convexity of the head shield (Fig. 6; se. Brazil) . . . . . *discigera* (Mayr)
- When head is viewed full-face, the arcuate flange or crest around the back of the head is continuous and entire, and is separated from the central convexity of the head shield by a broad, uninterrupted sulcus (Fig. 7; Trinidad)..... *militaris* Weber

#### Key to the species of *Octostruma*, based chiefly on workers

1. With fine but distinct carina arching from eye to eye across the head, separating the convex vertex from the concave frontal part (Figs. 20, 21) . . . . . 2
- The head without a distinct transverse arched carina across the middle of the head (although in some samples of *O. balzani* there is an indistinct suggestion of this carina)..... 3
2. All of dorsum of head and alitrunk uniformly and densely punctulate, opaque (Fig. 21; se. Brazil)..... *rugifera* (Mayr)
- Dorsum of head vaguely rugose over basic punctation; concave part of the surface indefinitely rugulose, becoming almost smooth and strongly shining where it joins clypeus; pronotum with rugulose oversculpture, more or less transverse (Fig. 20; s. Mexico)..... *rugiferoides* Brown & Kempf
3. Mesonotum of worker with a broad, shallow longitudinal sulcus, often extending onto pronotum and propodeum; worker usually and female always with coarse irregular longitudinal rugulae covering most of dorsum of head (Fig. 17; widespread).... *jheringi* (Emery)
- Mesonotum and pronotum of worker convex or nearly flat, without a trace of a longitudinal sulcus; dorsal surface of head never clearly longitudinally costate in worker or female..... 4
4. Head proper always slightly longer than broad; size large, combined length of worker head and closed mandibles 1.00 mm or more (possibly slightly less in the very smallest workers); female large, gaster over 1.5 mm wide; worker propodeal teeth reduced to a narrow lamellar margin on each side of the declivity, subrectangular above (Figs. 16, 29; Peru, Bolivia)..... *inca* Brown & Kempf
- Head proper slightly broader than long and/or size smaller; combined

- length of head and closed mandibles of worker under 1.00 (in workers from se. Brazil, head may be slightly longer than broad, but then size is small); female smaller, width of gaster under 1.5 mm; worker propodeal teeth well developed, projecting, more or less acutely triangular . . . . . 5
5. Body of worker, including head, smooth and very finely and superficially shagreened, but not shining, except weakly on gaster; worker head width usually over 0.80 mm; female gaster width over 1.3 mm; female rugulose-punctate over head, alitrunk and nodes, gaster densely punctulate (Figs. 15, 23; se. Brazil)... *petiolata* (Mayr)
- Body of worker, and especially the head, distinctly reticulate-punctate or rugulose-punctulate, not smooth; worker head width usually under 0.80 mm . . . . . 6
6. Head of worker shallowly rugulose-punctulate (probably usually between 0.70 and 0.80 mm wide; C. America)..... *wheeleri* Mann
- Body including head finely and densely reticulate-punctulate; size smaller (HW under 0.75 mm) . . . . . 7
7. Size larger; HW of unique type worker 0.71 mm; lateral lamellar lobe behind eye well developed, rounded (Fig. 19; Amazonas)..... *batesi* (Emery)
- Size smaller, worker HW under 0.69 mm (ergatoid female to about 0.70 mm); lateral lobe behind eye reduced to a small obtuse angle, or obsolete (Figs. 18, 22, 27, 28; widespread in tropical America)... 8
8. In zone of sympatry (se. Brazil and possibly adjacent areas) basal tooth of mandible narrow and pointed, leaving a notable space between mandible and clypeus at full closure; head averaging more slender (CI 94-103) (Figs. 25, 28) (se. Brazil)..... *stenognatha* Brown & Kempf
- Mandibles usually (invariably in se. Brazil) with broad, rounded basal teeth, leaving no anteclypeal space at full closure; worker head broader (CI 101-113, usually over 103) (Figs. 18, 22, 24, 26, 27; widespread) . . . . . *balzani* (Emery)

#### Key to the species of *Eurhopalothrix* in the New World (Workers and females)

1. (Worker) Propodeum without teeth; pilosity uniform and evenly distributed, consisting of numerous small, oval, subappressed squamiform hairs over dorsal surfaces of body, legs and scapes; no specialized erect hairs (Fig. 39; Argentina: Cordoba)..... *bruchi* (Santschi)
- Propodeum with well-developed teeth or angular, erect lamellae; pilosity differentiated into smaller appressed and subappressed ground hairs and larger specialized (erect clavate or pompon-like) hairs arranged in a symmetrical pattern..... (*bolaii* group) 2
2. Larger specialized hairs of head (in normal, undamaged complement) 18 in number, arranged in 3 transverse rows of 8, 4 and 6 (Figs. 35-38) . . . . . 3
- Larger specialized hairs of head at most 6, restricted to the posterior part of the head (Figs. 33, 34)..... 7
3. Clypeus separated into a small, triangular posterior part and a large, sloping, concave anterior part by an arcuate transverse carina (Fig. 37; British Guiana) . . . . . *clypeata* Brown & Kempf
- Clypeus without a transverse carina, its surface continuous..... 4

4. Head less wide (CI under 95 in both worker and female; Fig. 38); propodeal lamellae of worker broad, with subrectangular upper corner and nearly straight, almost vertical margin beneath (s. Mexico, se. Brazil) . . . . . *pilulifera* Brown & Kempf
- Head wide (CI 95 or more; Figs. 35, 36); propodeal teeth of worker acute and projecting, each with a narrow, concave, strongly receding infradental lamella . . . . . 5
5. Small species (worker head width under 0.57 mm; Trinidad) . . . . . *alopeciosa* Brown & Kempf
- Larger species (worker head width over 0.57 mm; Figs. 35, 36) . . . . . 6
6. Head more narrow, with rounded lateral occipital angles (head width of worker under 0.67 mm, of female, ca. 0.70 mm; Fig. 36; Central America, n. South America) . . . . . *bolaii* (Mayr)
- Head broader, with lateral occipital angles sharper and more projecting (head width of worker over 0.69 mm; of female, over 0.75 mm; Fig. 35; Central America, Lesser Antilles, se. Brazil) . . . . . *gravis* (Mann)
7. Dorsum of head with a single pair of erect clavate hairs on vertex; 3 pairs of erect clavate hairs on alitrunk, including 1 pair on anterior pronotum (Fig. 34; s. Florida) . . . . . *floridana* Brown & Kempf
- Dorsum of head with 6 thick, suberect hairs situated in circular pits: 1 on each posterior occipital angle, and 2 pairs arranged closely in a rectangle on the vertex; mesonotum with 2 pairs of thick hairs, none on pronotum (Figs. 31-33; se. Brazil) . . . . . *speciosa* Brown & Kempf

**Key to the species of Eurhopalothrix in the Indo-Australian Region  
(Workers and females)**

1. Larger species, greatest width of head over 0.93 mm . . . . . (procera group) 2
- Smaller species, greatest width of head, at least in worker, under 0.93 mm . . . . . 3
2. Head, alitrunk and nodes rather coarsely rugose; posterior sides of alitrunk covered with coarse diagonal costation; first gastric tergite, except for a narrow median strip, uniformly covered with conspicuous subreclinate squamiform hairs; larger erect hairs differentiated in female, but not in worker; head width averaging over 1.30 mm (Fiji) . . . . . *emeryi* (Forel)
- Body variously sculptured, but not coarsely rugose; posterior sides or alitrunk nearly smooth, at most feebly punctulate or shagreened, and in most specimens more or less shining; first gastric tergite with ground pilosity minute, sparsely and unevenly distributed, or obsolete; one or more pairs of erect clavate hairs often present on its disc; head width only rarely (in Philippines) over 1.30 mm wide, usually much less (Figs. 41, 49; Philippines, etc., and Borneo to Solomons and Cape York; Samoa; Palau Group) . . . . . *procera* (Emery)
3. Posterior third of head covered thickly with conspicuous, white, orbicular squamiform hairs (including the specialized hairs, which are only weakly differentiated in this species); pilosity of anterior 2/3 of head abruptly reduced to fine minute vestiges, this area appearing naked by contrast (Figs. 1, 42, 53; ne. New Guinea) . . . . . *biroi* (Szabó)
- Pilosity of head otherwise; either reduced throughout, or without an abrupt difference between anterior and posterior sections; specialized larger hairs, when present on dorsum of head, strongly differentiated and more or less erect and clavate (Figs. 43-47) . . . . . 4

4. Specialized erect hairs of head absent or reduced to a single median pair on the verticociput (Figs. 43, 47)..... 5
- Specialized erect hairs of head (when complement is not damaged) 16-18 in number, arranged in 3 transverse rows (Figs. 44-46)..... 7
5. Smaller species (worker alitrunk L under 0.65 mm), completely lacking specialized erect hairs on dorsum of head (Fig. 43); propodeal teeth projecting and acute, with narrow concave infradental lamella (Figs. 43, 54; ne. New Guinea)..... *punctata* (Szabó)
- Larger species (worker alitrunk over 0.65 mm), with a pair of small erect hairs on verticociput; propodeal teeth short, obtuse or rectangular..... 6
6. Posterior occipital angles not developed, so that the posterior outline of the head (seen full-face) between lateral occipital angles is broadly arcuate, with only a slight emargination medially in place of the posterior excision (Fig. 47); metanotal groove obsolete, the alitruncal profile smoothly continuous (Fig. 50; Philippines).....
- *philippina* Brown & Kempf
- Posterior occipital angles strong, subrectangular, separated by a broad and deep posterior excision; metanotal groove distinct (Solomons)..... *isabellae* (Mann)
7. Larger species (worker alitrunk L over 0.65 mm); dorsal face of propodeum with an angular impression or "step" at its midlength (Figs. 44, 52; New Caledonia)..... *caledonica* Brown & Kempf
- Smaller species (alitrunk L under 0.65 mm); dorsal face of propodeum forming an evenly concave slope (Figs. 51, 55)..... 8
8. Very small species (worker alitrunk L under 0.52 mm; Fig. 55); clypeus divided by a transversely arched carina (Fig. 45; n. New Guinea, New Britain)..... *brevicornis* (Emery)
- Slightly larger species (worker alitrunk L over 0.52 mm, Figs. 46, 51; Queensland)..... *australis* Brown & Kempf

#### Key to New World species of *Rhopalothrix* (workers and females)

1. Body covered with numerous erect, bristly, slender clavate and truncate hairs, over 30 on head alone (only female known, Fig. 60, n. Argentina)..... *kusnezovi* Brown & Kempf
- Pilosity otherwise; head either without conspicuous pilosity, or with a patterned arrangement of up to 20 broadened hairs on the posterior dorsum (Figs. 57, 58, 61)..... 2
2. Posterior half of head with about 20 broadened hairs arranged in a symmetrical pattern; compound eyes distinct in worker; size larger, head proper over 0.65 mm long (Fig. 61; Colombia).... *ciliata* Mayr
- Posterior half of head without conspicuous erect or broadened pilosity; size smaller, head under 0.65 mm long..... 3
3. Labrum with transverse apical margin merely sinuate or feebly emarginate, not divided by a deep cleft (Fig. 57; s. Mexico).....
- *stannardi* Brown & Kempf
- Labrum with a deep median cleft or notch extending inward from its apex nearly to its midlength..... 4
4. Subapical spiniform tooth of mandible much longer than the basal width of mandible; anterior clypeal margin convex in the middle (Panama)..... *isthmica* Weber

- Subapical spiniform tooth of mandible not or scarcely longer than basal width of mandible; anterior clypeal margin concave in the middle . . . . . 5
5. Dorsum of head with a pair of well-defined transverse ridges; clypeus without conspicuous subappressed oval setae (Cuba) . . . . . *weberi* Brown & Kempf
- Dorsum of head without a pair of well-defined transverse ridges; clypeus with conspicuous subappressed oval setae (Fig. 58) . . . . . *plaumanni* Brown & Kempf

Note. — The single known Old World species of *Rhopalothrix*, *R. diadema* Brown & Kempf (New Guinea), is distinguished from the New World forms by its peculiar labrum, its mandibles and its pilosity, among other characters (see Fig. 59).

### Synonymic Synopsis of the Genera and Species

(w = worker; f = female; m = male)

### Basicerotini Brown, 1949

#### *Basiceros* Schulz, 1906

= *Ceratobasis* Fr. Smith, 1860 *nec* Lacordaire, 1848

*convexiceps* (Mayr, 1887) w f m — se. Brazil

= *squamifer* Borgmeier, 1937, n. syn.

*manni*, n. sp. w f — Costa Rica, Honduras

*singularis* (Fr. Smith, 1858) w f — Amazon-Guianas

*Creightenidris* Brown, 1949

*scambognatha* Brown, 1949 f — Brazil: Goiás, Pará

#### *Aspididris* Weber, 1950

*discigera* (Mayr, 1887) w f — se. Brazil

*militaris* Weber, 1950 w f — Trinidad

#### *Octostruma* Forel, 1912

##### Group of *petiolata*

*inea*, n. sp. w f — Peru, Bolivia

*jheringi* (Emery, 1887) w f — Guatemala to se. Brazil; Jamaica

= *simoni* (Emery, 1890), n. syn.

= *godmani* (Forel, 1899), n. syn.

= *simoni* var. *wighti* (Wheeler, 1908), n. syn.

= *simoni spei* (Forel, 1912), n. syn.

= *simoni spei* var. *sulcata* (Santschi, 1936), n. syn.

*petiolata* (Mayr, 1887) w f — se. Brazil

*wheeleri* (Mann, 1922) w — Guatemala, Costa Rica

##### Group of *balzani*

*balzani* (Emery, 1894) w f — s. Mexico to se. Brazil; Dominica

= *lutzi* (Wheeler, 1913), n. syn.

= *barberi* (Mann, 1922), n. syn.

= *equilatera* (Weber, 1934), n. syn.

*batesi* (Emery, 1894) w — Brazil: Amazonas

*rugifera* (Mayr, 1887) w f — se. Brazil to ne. Argentina

= *truncata* (Forel, 1912), n. syn.

*rugiferoides*, n. sp. w — Mexico: Vera Cruz

*stenognatha*, n. sp. w f — se. Brazil



*Eurhopalothrix*, n. gen.Group of *bolau*

- alopeciosa*, n. sp. w — Trinidad
- bolau* (Mayr, 1870) w f — Dutch Guiana to Honduras
- = *amoena* (Mann, 1922), n. syn.
- clypeata*, n. sp. w — British Guiana
- floridana*, n. sp. w — Florida, U.S.A.
- gravis* (Mann, 1922) w f — s. Mexico to se. Brazil; Dominica
- = *reichenspergeri* (Santschi, 1923), n. syn.
- = *schmidti* (Menozi, 1936), n. syn.
- pilulifera*, n. sp. w f — Mexico: Tabasco; Brazil: Rio
- speciosa*, n. sp. w — Brazil: S. Catarina

Group of *bruch*

- bruch* (Santschi, 1922) w — Argentina: Córdoba

Group of *brevicornis*

- australis*, n. sp. w f — n. Queensland
- brevicornis* (Emery, 1897) w f — N. Guinea, N. Britain
- = *mixta* (Szabó, 1910), n. syn.
- caledonica*, n. sp. w — N. Caledonia
- punctata* (Szabó, 1910) w f — N. Guinea

Group of *biroi*

- biroi* (Szabó, 1910) w m — N. Guinea
- isabellae* (Mann, 1919) w — Solomons: Isabel I.
- philippina*, n. sp. w f — Philippines: Negros I.

Group of *procera*

- emeryi* (Forel, 1912) w f — Fiji Is.
- = *elegans* (Mann, 1921), n. syn.
- procera* (Emery, 1897) w f m — N. Guinea, Philippines, Samoa, etc.
- = *procera* var. *ballionii* (Forel, 1904), n. syn.
- = *borneensis* (Wheeler, 1919), n. syn.
- = *procera malua* (Mann, 1919), n. syn.
- = *procera malua* var. *melanotica* (Mann, 1919), n. syn.
- = *manni* (Menozi, 1923), n. syn.
- = *angulinodis* (Stitz, 1925), n. syn.
- = *procera samoana* (Santschi, 1928), n. syn.
- = *kokodensis* (Donisthorpe, 1936), n. syn.
- = *subdentatus* (Donisthorpe, 1942), n. syn.

*Rhopalothrix* Mayr, 1870

- = *Heptastruma* Weber, 1934, n. syn.
- = *Acanthidris* Weber, 1941, n. syn.
- ciliata* Mayr, 1870 w — Colombia
- diadema*, n. sp. w — N. Guinea
- isthmica* (Weber, 1941) w — Panama C. Z.
- kusnezovi*, n. sp. f — Argentina: Tucumán
- plummanni*, n. sp. w — Brasil: S. Catarina
- stannardi*, n. sp. w — Mexico: Chiapas
- weberi*, n. n. w — Cuba
- = *wheeleri* (Weber, 1934) nec Mann, 1922

*Talaridris* Weber, 1941

- mandibularis* Weber, 1941 w f — Trinidad

## List of References

- Borgmeier, T., 1937, Formigas novas ou pouco conhecidas da América do Sul e Central, principalmente do Brasil. — Arch. Inst. Biol. Veget., Rio de Janeiro, 3: 217-255.
- Brown, W. L., Jr., 1948, A preliminary generic revision of the higher Dacetini (Hymenoptera: Formicidae). — Trans. Amer. Ent. Soc., 74: 101-129.
- 1949, Revision of the ant tribe Dacetini: IV. Some genera properly excluded from the Dacetini, with the establishment of the Basicerotini new tribe. — Trans. Amer. Ent. Soc., 75: 83-96.
- 1953, Revisionary studies in the ant tribe Dacetini. — Amer. Midl. Nat., 50: 1-137 (cf. pp. 7-15).
- 1958, Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). — Bull. Mus. Comp. Zool., 118: 173-362.
- Brown, W. L., Jr. and W. L. Nutting, 1950, Wing venation and the phylogeny of the Formicidae (Hymenoptera). — Trans. Amer. Ent. Soc., 75: 113-132.
- Brown, W. L., Jr. and E. O. Wilson, 1957, Dacetinops, a new ant genus from New Guinea. — Brev. Mus. Comp. Zool., 77: 1-7.
- Emery, C., 1894, Studi sulle formiche della fauna neotropica. — Bull. Soc. Ent. Ital., 26: 137-241 (cf. pp. 216-218).
- 1897, Formicidarum species novae vel minus cognitae... in Nova-Guinea... collegit L. Biró. — Termeszetr. Füzt., 20: 571-599, pl. 14, 15.
- 1922, Gen. Insect., Fasc. 174, Formicidae subfam. Myrmicinae (cf. pp. 327-329).
- Forel, A., 1912, Formicides neotropiques. Part. II. 3me sous-famille Myrmicinae Lep. (Attini, Dacetii, Cryptocerini). — Mem. Soc. Ent. Belg., 19: 179-209.
- Mann, W. M., 1919, The ants of the British Solomon Islands. — Bull. Mus. Comp. Zool., 63: 271-391.
- 1922, Ants from Honduras and Guatemala. — Proc. U. S. Nat. Mus., 61 (13): 1-54.
- Mayr, G., 1870, Formicidae novogranadensis. — Sitzb. Akad. Wiss. Wien, 61: 370-417.
- 1887, Südamerikanische Formiciden. — Verh. zool.-bot. Ges. Wien, 37: 511-632.
- Schulz, W. A., 1906, Spolia Hymenopt. (cf. p. 156).
- Smith, Fr., 1858, Cat. Hym. Brit. Mus., Part 6 (cf. p. 195).
- 1860, Descriptions of new genera and species of exotic Hymenoptera. — Jour. Ent., 1: 65-84, pl. 4.
- Szabó, J., 1910, Formicides nouveaux ou peu connus des collections du Musée National Hongrois. — Ann. Mus. Nat. Hungar., 8: 364-369.
- Weber, N. A., 1934, Notes on neotropical ants, including the descriptions of new forms. — Revista Ent., Rio de Janeiro, 4: 22-59.
- 1941, Four new genera of Ethiopian and neotropical Formicidae. — Ann. Ent. Soc. Amer., 34: 183-194.
- 1950, New Trinidad Myrmicinae, with a note on *Basiceros* Schulz (Hymenoptera, Formicidae). — Amer. Mus. Novit., 1465: 1-6.
- Wheeler, G. C., and J. Wheeler, 1954, The ant larvae of the myrmicine tribes Basicerotini and Dacetini. — Psyche, 61: 111-145.
- Wilson, E. O., 1957 (1956), Feeding behavior in the ant *Rhopalothrix biroí* Szabó. — Psyche, 63: 21-23.